T E N D E R S P E C I F I C A T I O N

No. - BHE/PW/PUR/PARST– BPM2/ 511 (REV-00)

FOR

MATERIAL HANDLING AND MANAGEMENT INCLUDING RECIEPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF BOILER & AUX, STG & AUXILIARIES, ELECTRICAL, C&I, PIPING, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T&P; PROVIDING MATERIALS MANAGEMENT SERVICES ETC., COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD; TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD; ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF BOILER AND AUXILIARIES INCLUDING ESP, ROTATING MACHINES, DUCTS & DAMPERS, FUEL PIPING, BOILER PIPING, POWER CYCLE PIPING ETC OF 2x250 MW UNIT # 2

AT

PARAS THERMAL POWER STATION EXPANSION PROJECT

MAHARASHTRA STATE POWER GENERATION COMPANY LTD

PARAS

DISTRICT AKOLA , MAHARASHTRA

PART I

{TECHNICAL BID SPECIFICATION, NOTICE INVITING TENDER & GCC}

BOOK NO.:

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR : WESTERN REGION
345, KINGSWAY : NAGPUR 440 001

C O N T E N T S

SN	DESCRIPTION	SECTION/ APPENDIX No.	No. OF PAGES
1.	TENDER SPECIFICATION ISSUE DETAILS	--	1
2.	PROCEDURE FOR SUBMISSION OF SEALED TENDER	--	2
3.	PROJECT INFORMATION	--	1
4.	CHECK LIST	--	1
5.	DECLARATION BY BIDDERS AUTHORISED REPRESENTATIVE	--	1
6.	CERTIFICATE OF NO DEVIATION	--	1
7.	NOTICE INVITING TENDER (NIT) INCLUDES QUALIFICATION REQUIREMENT	$	3
8.	REVERSE AUCTION PROCEDURE	$	11
9.	GENERAL CONDITIONS OF CONTRACT	SECTION-1 & 2 $	29
10.	OFFER OF BIDDER	SECTION-3	1
	SPECIAL CONDITIONS OF CONTRACT		
11.	SCOPE OF WORK	SECTION-4	23
12.	OBLIGATIONS OF THE CONTRACTOR (TOOLS, TACKLES & CONSUMABLES)	SECTION-5	05
13.	CONTRACTOR'S OBLIGATION IN REGARD TO EMPLOYMENT OF SUPERVISORY STAFF AND WORKMEN	SECTION-6	01
14.	OBLIGATIONS OF BHEL	SECTION-7	03
15.	INSPECTION/ QUALITY ASSURANCE/ QUALITY CONTROL/ STATUTORY INSPECTION	SECTION-8	03
16.	SAFETY MEASURES	SECTION-9	13
17.	DRAWINGS AND DOCUMENTS	SECTION-10	01
18.	TIME SCHEDULE/MOBILIZATION/ PROGRESS MONITORING/ OVER RUN.	SECTION-11	03
19.	TERMS OF PAYMENT	SECTION-12	04
20.	EXTRA CHARGES FOR MODIFICATION & RECTIFICATION	SECTION-13	02
21.	INSURANCE	SECTION-14	01
22.	EARNESH MONEY DEPOSIT & SECURITY DEPOSIT	SECTION-15	02
	APPENDICES		
23.	ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK	APPENDIX-I	16
24.	LIST OF IBR SITE WELD JOINTS	APPENDIX-II	02
25.	LIST OF T&P TO BE MADE AVAILABLE BY BHEL FREE OF CHARGES, ON SHARING BASIS	APPENDIX-III	01
26.	MAJOR T&P & MMD TO BE DEPLOYED BY THE	APPENDIX-IV	02

C O N T E N T S

SN	DESCRIPTION	SECTION/ APPENDIX No.	No. OF PAGES
	CONTRACTOR		
27.	ANALYSIS OF UNIT RATES QUOTED	APPENDIX-V	01
28.	MONTHWISE MANPOWER DEPLOYMENT PLAN BY THE CONTRACTOR	APPENDIX-VI	01
29.	CONTRACTOR'S MAJOR T&P DEPLOYMENT PLAN	APPENDIX-VII	01
30.	DETAILS OF CONCURRENT COMMITMENT	APPENDIX-VIII	01
31.	LIST OF SIMILAR JOBS DONE IN LAST SEVEN YEARS.	APPENDIX-IX	01
32.	RATE SCHEDULE (PRICE BID:PART -II)		@

$: ATTACHED AT THE END OF HARD COPY OF TENDER SPECIFICATION. ALSO HOSTED IN WEB PAGE AS PART OF NOTICE INVITING TENDER(FILE TITLED "NIT+RA+GCC-511").

@: ISSUED AS A SEPARATE BOOKLET AS HARD COPY AS PART II (PRICE BID SPECIFICATION) AND AS ALSO HOSTED IN WEB PAGE AS SEPARATE FILE TITLED "PRICE-BID-511".

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345, KINGSWAY - NAGPUR 440 001

TENDER SPECIFICATION ISSUE DETAILS.
TENDER SPECIFICATION NO:- BHE/PW/PUR/PARST-BPM2/511 (REV-00)

FOR

MATERIAL HANDLING AND MANAGEMENT INCLUDING RECIEPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF BOILER & AUXILIARIES, STG & AUXILIARIES, ELECTRICAL, C&I, PIPING, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T & Ps.; PROVIDING MATERIALS MANAGEMENT SERVICES ETC., COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD; TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD; ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF BOILER AND AUXILIARIES INCLUDING ESP, ROTATING MACHINES, DUCTS & DAMPERS, FUEL PIPING, BOILER PIPING, POWER CYCLE PIPING ETC OF 2x250 MW UNIT # 2

AT

PARAS THERMAL POWER STATION EXPANSION PROJECT

MAHARASHTRA STATE POWER GENERATION COMPANY LTD

PARAS

DISTRICT AKOLA, MAHARASHTRA

EARNEST MONEY DEPOSIT Rs. 2,00,000/- (RUPEES TWO LAKH ONLY)

THESE TENDER DOCUMENTS CONTAINING **PART-I** : TECHNICAL BID AND **PART- II** : PRICE BID, ARE ISSUED TO:

M/s……

……..

(THESE TENDER DOCUMENTS ARE NOT TRANSFERABLE)

FOR BHARAT HEAVY ELECTRICALS LIMITED

DGM (Purchase)

PLACE: NAGPUR
DATE :

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

THE TENDERER MUST SUBMIT THEIR TENDERS AS REQUIRED IN TWO PARTS IN SEPARATE SEALED COVERS PROMINENTLY SUPERSCRIBED AS PART-I TECHNICAL BID AND PART-II PRICE BID AND ALSO INDICATING ON EACH OF THE COVERS THE TENDER SPECIFICATION NUMBER AND DUE DATE AND TIME AS MENTIONED IN THE TENDER NOTICE.

Part-I (Technical Bid) cover-I:

Excepting rate schedule, all other schedules, data sheets and details called for in the specification shall be enclosed in part-I "Technical Bid" only.

EARNEST MONEY DEPOSIT (EMD)

EMD shall be included in the Technical Bid. **EMD shall be paid by bidders only in the form of account payee Demand Draft payable at Nagpur in favour of Bharat Heavy Electricals Limited.** No other mode of payment of EMD shall be acceptable.
Bidder may opt to deposit "One Time EMD" of Rs. 2.0 lacs with this office (BHEL:PSWR:Nagpur) which will enable them to participate in all the future tender enquiries in respect of Erection and Commissioning services issued from this office. Interested bidders may clearly send their consent for converting the present EMD into an "One Time EMD" in their offer.
Bidders who have already submitted such "One Time EMD" will be exempted from submission of any EMD for this tender. However bidder shall furnish details of the "One Time EMD" in his offer including the Check List furnished herein.

Part-II (Price Bid) cover-II:

All indications of price shall be given in this part-II "Price Bid". **EMD shall not be included in this cover.**

THESE TWO SEPARATE COVERS-I AND II (PART-I AND PART-II) SHALL TOGETHER BE ENCLOSED IN A THIRD ENVELOPE (COVER-III) ALONGWITH REQUISITE EMD AS INDICATED EARLIER AND THIS SEALED COVER SHALL BE SUPERSCRIBED AND SUBMITTED TO ADDL. GENERAL MANAGER (PURCHASE) AT THE ABOVE MENTIONED ADDRESS ON OR BEFORE THE DUE DATE AS INDICATED.

THE QUALIFIED TENDERER WILL BE INTIMATED SEPARATELY ABOUT THE STATUS OF THEIR OFFER.

TENDERER ARE REQUESTED TO MAKE SPECIFIC NOTE OF THE FOLLOWING CONDITIONS:

1. CONTRACTOR SHOULD HAVE ADEQUATE RESOURCES INCLUDING MAJOR T&P AT HIS DISPOSAL FOR THIS JOB.

2. CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.

3. TENDERER SHOULD MEET QUALITY REQUIREMENT REGARDING WORKMANSHIP, DEPLOYMENT OF PERSONNEL, ERECTION TOOLS AND NECESSARY INSPECTION, MEASUREMENT & TESTING INSTRUMENTS.

4. BIDDER SHALL MEET ALL THE QUALIFYING REQUIREMENTS AS MENTIONED IN THE NOTICE INVITING TENDER.

5. ALL INFORMATION AS CALLED FOR IN VARIOUS APPENDICES AND CLAUSES OF TENDER SPECIFICATION, SHOULD BE FURNISHED. PLEASE REFER THE CHECKLIST. THE DETAILS SO FURNISHED BY TENDERER SHOULD BE COMPLETE IN ALL RESPECTS AND AS PER FORMATS SPECIFIED IN TENDER SPECIFICATION.

6. OFFERS RECEIVED WITH ANY DEVIATION OR WITHOUT RELEVANT INFORMATION AS DESCRIBED ABOVE ARE LIABLE TO BE REJECTED. PRICE BIDS RECEIVED IN THE FORM OTHER THAN SPECIFIED IN PART -II (PRICE BID) ARE LIABLE TO BE REJECTED.

7. TENDERER SHALL NOTE THAT THEIR OFFER WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF BHEL'S CUSTOMER.

PROJECT INFORMATION

1.0 INTROCUCTION

The owner Maharashtra State Power Generation Company Limited is expanding the existing Paras Thermal Power Station presently having one 62.5 MW unit and one 250MW unit with the second 250 MW unit at Paras, Distri, Maharashtra State. The proposed site is adjacent to ongoing 250MW expansion TPS and about 2 KM from Paras Village.

Project : Paras Thermal Power Station Expansion Project

Project location : Paras, District Akola, Maharashtra State

2.0 APPROACH TO SITE

By Rail :Paras railway station located on Bhusawal Nagpur section of Central Railway broad guage. Power Station is 2 Km away from Paras Railway Station.

By Road : The Site is connected by all weather tar road to national Highway no 6 which is 6 KM from Plant Site. Site is approachable from Akola City

3.0 CLIMATIC CONDITIONS

a). Dry Bulb temperature	:	44^0 C Max, 12^0 C Min
b). Wet Bulb temperature	:	27^0 C Max, 22^0 C Min
c) Maximum Relative Humidity	:	96%
d) Minimum Relative Humidity	:	22%
e) Rainfall	:	800 mm Max
f) Seismic Zone	:	II
g) Height above MSL	:	282.4 M
h) Wind Speed	:	39 m/sec

CHECK LIST

(VIDE PARA 1.3 OF SECTION-I OF GENERAL CONDITIONS OF CONTRACT)

1	NAME OF THE TENDERER WITH ADDRESS			
2	NATURE OF THE FIRM	Limited / Partnership / Proprietary		
3	NAME AND TELEPHONE & FAX NO OF CONTACT PERSON	NAME : MR/MS TELEPHONE : FAX :		
3	EMD DETAILS (Rs. 2.0 LACS BY DD ONLY OR ONE TIME EMD)	DD NO: DATE: BANK: AMOUNT: PLEASE TICK (v) WHICHEVER APPLICABLE:- ONE TIME EMD / ONLY FOR THIS TENDER		
4	VALIDITY OF OFFER (TO BE VALID FOR 180 DAYS FROM DUE DATE)			
5	MOBILIZATION TIME (NOT EXCEEDING THREE WEEKS FROM FAX LOI-SEE SECTION 11 OF SCC)			
6	WHETHER NO DEVIATION CERTIFICATE FURNISHED		YES	NO
7	TENDERER HAS VISITED THE PROJECT SITE AND ACQUAINTED WITH THE SITE CONDITIONS		YES	NO
8	DETAILS OF CONCURRENT JOBS ARE FURNISHED (AS PER APPENDIX-VIII)		YES	NO
9	HEAD QUARTER'S ORGANISATION IS FURNISHED		YES	NO
10	PROPOSED SITE ORGANISATION IS FURNISHED		YES	NO
11	FINANCIAL STATUS OF THE COMPANY (ANNEXURE 'A' OF GCC) IS FURNISHED		YES	NO
12	AUDITED PROFIT & LOSS ACCOUNT FOR PRECEDING THREE YEARS IS FURNISHED		YES	NO
13	LATEST SOLVENCY CERTIFICATE FROM THE BANKER IS FURNISHED		YES	NO
14	LATEST INCOME TAX CLEARANCE CERTIFICATE OR COPY OF PAN CARD ACCOMPANIED BY 'IT RETURN' COPY IS FURNISHED		YES	NO
15	MANPOWER DEPLOYMENT PLAN (APPENDIX–VI) IS FURNISHED		YES	NO
16	MONTHWISE DEPLOYMENT PLAN FOR MAJOR T&P (APPENDIX-VII) IS FURNISHED		YES	NO
17	ANALYSIS OF UNIT RATES QUOTED (APPENDIX –V) IS FURNISHED		YES	NO
18	POWER OF ATTORNEY ENCLOSED IN FAVOUR OF PERSON MAKING OFFER.		YES	NO
19	DETAILS OF SIMILAR WORK DONE IN LAST SEVEN YEARS AS PER APPENDIX – IX AND SUPPORTING DOUCMENTS FURNISHED.		YES	NO

20	ERECTION AND COMMISSIONING PROGRAMME.	YES	NO
21	BIDDER HAS FAMILIARIZED HIMSELF WITH ALL RELEVANT LOCAL LAWS & CONDITIONS.	YES	NO
22	WHETHER ALL THE PAGES OF THE TENDER DOCUMENTS ARE READ, UNDERSTOOD AND SIGNED	YES	NO

NOTE : STRIKE OFF YES OR NO, AS APPLICABLE

DATE : SIGNATURE OF TENDERER

DECLARATION BY BIDDER'S AUTHORIZED SIGNATORY

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION No. **BHE/PW/PUR/PARST-BPM2/511 (REV-00)** ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE. I HAVE GONE THROUGH THE SPECIFICATIONS, CONDITIONS AND STIPULATIONS IN DETAIL AND AGREE TO COMPLY WITH THE REQUIREMENTS AND INTENT OF THE SPECIFICATION. I FURTHER CERTIFY THAT I AM DULY AUTHORIZED REPRESENTATIVE OF THE UNDER-MENTIONED TENDERER AND A VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED.

AUTHORISED REPRESENTATIVE'S SIGNATURE WITH
NAME AND ADDRESS

DATE:

TENDERER'S NAME AND ADDRESS

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION No.

BHE/PW/PUR/PARST-BPM2/511 (REV-00)

I/WE, M/s ……

HEREBY CERTIFY THAT IN OUR OFFER I/WE HAVE NEITHER SET ANY TERMS AND CONDITIONS NOR THERE ANY DEVIATION TAKEN FROM THE TENDER CONDITIONS EITHER TECHNICAL OR COMMERCIAL AND I/WE AGREE TO ALL THE TERMS AND CONDITIONS MENTIONED IN THE TENDER SPECIFICATION.

SIGNATURE OF THE TENDERER

DATE:

SECTION-3
OFFER OF THE CONTRACTOR

Sr DGM (Purchase)
BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345, KINGSWAY
NAGPUR- 440 001

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. BHE/PW/PUR/PARST-BPM2/511 (REV-00) ISSUED BY BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR-WESTERN REGION, NAGPUR, IN ACCORDANCE WITH THE TERMS AND CONDITIONS THEREOF.

I/WE HAVE CAREFULLY PERUSED THE FOLLOWING LISTED DOCUMENTS CONNECTED WITH THE ABOVE WORK AND AGREE TO ABIDE BY THE SAME.

1. INSTRUCTIONS TO TENDERERS
2. GENERAL CONDITIONS OF CONTRACT
3. SPECIAL CONDITIONS OF CONTRACT
4. OTHER SECTIONS, APPENDICES, SCHEDULES AND DRAWINGS.

I/WE HAVE DEPOSITED / FORWARDED HEREWITH THE EARNEST MONEY DEPOSIT FOR A SUM OF RS. 2,00,000/- (RUPEES TWO LAKH ONLY) DETAILS OF EMD PAYMENT ARE FURNISHED IN THE CHECK LIST.

EMD SHALL BE REFUNDED SHOULD OUR OFFER NOT BE ACCEPTED / EMD **NEED NOT BE REFUNDED AND THE AMOUNT MAY BE TREATED AS "ONE TIME EMD" FOR ERECTION AND COMMISSIONING TENDERS OF BHEL-PSWR, NAGPUR**. SHOULD OUR OFFER BE ACCEPTED, I/WE FURTHER AGREE TO DEPOSIT SECURITY DEPOSIT FOR THE WORK AS PROVIDED FOR IN THE TENDER SPECIFICATION WITHIN THE STIPULATED TIME AS MAY BE INDICATED BY BHEL, POWER SECTOR-WESTERN REGION, NAGPUR.

I/WE FURTHER AGREE TO EXECUTE ALL THE WORKS REFERRED TO IN THE SAID DOCUMENTS UPON THE TERMS AND CONDITIONS CONTAINED OR REFERRED TO THEREIN AND AS DETAILED IN THE APPENDICES ANNEXED THERETO.

PLACE: SIGNATURE OF TENDERER:
DATE : ADDRESS:

WITNESSES WITH THEIR ADDRESS

	SIGNATURE	NAME	ADDRESS
1.			
2.			

SECTION-4
SPECIAL CONDITIONS OF CONTRACT

SCOPE OF WORK

4.0 GENERAL

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER:

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER:

1) MATERIAL HANDLING AND MANAGEMENT INCLUDING RECIEPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF BOILER & AUX, STG & AUX, ELECTRICAL, C&I, PIPING, LINING & INSULATION AND OTHER MATERIALS AND T & P OF BHEL; PROVIDING MATERIALS MANAGEMENT SERVICES ETC.

2) TRANSPORTATION / DRAGGING OF BOILER DRUM FROM UNLOADING BAY TO INSIDE BOILER STRUCTURES AND POSITIONING ON GROUND, ERECTION INCLUDING FINAL ALIGNMENT.

3) COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD; TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD; ERECTION, TESTING & COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF BOILER AND AUXILIARIES INCLUDING ESP, ROTATING MACHINES, DUCTS & DAMPERS, FUEL PIPING, BOILER PIPING, POWER CYCLE PIPING ETC.

4) TRANSPORTATION / DRAGGING OF BOILER DRUM FROM UNLOADING BAY TO INSIDE BOILER STRUCTURES AND POSITIONING ON GROUND, ERECTION INCLUDING FINAL ALIGNMENT.

5) PRE-ASSEMBLY, IF ANY, PRE-ERECTION CHECKS AS APPLICABLE

6) ERECTION, ALIGNMENT AND WELDING, BOLTING, FASTENING, GROUTING AS APPLICABLE OF :

   a) BOILER SUPPORTING STRUCTURES
   b) BOILER PRESSURE PARTS
   c) BOILER TRIM & INTEGRAL PIPING AND MOUNTINGS
   d) FUEL OIL PIPING
   e) NON-PRESSURE PARTS
   f) ROTATING MACHINES (e.g. MILLS, FANS, BLOWERS etc. WITH THEIR DRIVES & LUBE OIL SYSTEM ETC.)
   g) ELECTROSTATIC PRECIPITATOR
   h) PULVERISED FUEL PIPING
   i) EXTERNAL STRUCTURES (e.g. DUCT SUPPORTING, PIPE RACK STRUCTURES etc.) INCLUDING ELEVATOR STRUCTURE.
   j) HANDLING ARRANGEMENTS FOR ROTATING MACHINES
   k) POWER CYCLE PIPING
   l) FABRICATION OF RACK STRUCTURES AND EMBEDMENTS

7) NON-DESTRUCTIVE EXAMINATION & POST WELD HEAT TREATMENT

8) PRE-COMMISSIONING CHECKS/TESTS, TRIAL RUNS/TESTING AND COMMISSIONING

9) TRIAL OPERATION AND ASSOCIATED TESTS

10) COMPLETION OF FACILITY/SYSTEMS

11) HANDING OVER OF THE UNIT

4.1 SCOPE OF WORK IS FURTHER DETAILED IN VARIOUS CLAUSES HEREINAFTER.

4.1.1 GENERAL REQUIREMENTS – COMMON TO ALL WORK

4.1.1.1
THE INTENT OF SPECIFICATION IS TO PROVIDE SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIAL NECESSARY FOR PROPER AND EFFICIENT EXECUTION OF THIS WORK SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

4.1.1.2
THE TERMINAL POINTS DECIDED BY BHEL SHOULD BE FINAL AND BINDING ON THE CONTRACTOR FOR DECIDING THE SCOPE OF WORK AND EFFECTING PAYMENT FOR THE WORK DONE.

4.1.1.3
THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING MAJOR POWER PLANT CONSTRUCTION AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF BHEL, BHEL'S CUSTOMER, CUSTOMER'S CONSULTANTS AND OTHER CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK OF THE PROJECT AS A WHOLE.

4.1.1.4
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, SUPERVISION, ENGINEERING AND CONSTRUCTION MANAGEMENT. THE CONTRACTOR SHOULD ENSURE PROPER PLANNING AND SUCCESSFUL & TIMELY COMPLETION OF THE WORK TO MEET THE OVERALL PROJECT SCHEDULE. THE CONTRACTOR MUST DEPLOY ADEQUATE QUANTITY OF TOOLS & PLANTS, MODERN / LATEST CONSTRUCTION AIDS ETC. HE MUST ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

4.1.1.5
CONTRACTOR SHALL ERECT AND COMMISSION ALL THE EQUIPMENTS AND AUXILIARIES AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL DEPENDING UPON THE TECHNICAL REQUIREMENTS. AVAILABILITY OF MATERIALS AND FRONTS WILL DECIDE THIS. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS / SEQUENCE ADOPTED IN ERECTION OF SIMILAR SETS ELSEWHERE.

4.1.1.6
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK FROM THE RESPECTIVE STATUTORY/ LOCAL AUTHORITIES ARE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST IN TIME TO ENSURE SMOOTH PROGRESS OF WORK.

4.1.1.7
THE BOILER SHALL BE ERECTED AS PER RELEVANT PROVISIONS OF LATEST INDIAN BOILER REGULATIONS AND AMENDMENTS/ADDENDUMS THEREOF, IF ANY.

4.1.1.8
THE WORK SHALL CONFORM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS DRAWINGS / DOCUMENTS THAT WILL BE PROVIDED DURING VARIOUS STAGES OF ERECTION. IF ANY PORTION OF WORK IS FOUND TO BE DEFECTIVE IN WORKMANSHIP, NOT CONFORMING TO

DRAWINGS OR OTHER STIPULATIONS DUE TO CONTRACTOR'S FAULT, THE CONTRACTOR SHALL DISMANTLE AND RE-DO THE WORK DULY REPLACING THE DEFECTIVE MATERIALS AT HIS COST, FAILING WHICH THE WORK WILL BE GOT DONE BY BHEL AND RECOVERIES WILL BE EFFECTED FROM THE CONTRACTOR'S BILLS TOWARDS EXPENDITURE INCURRED INCLUDING COST OF MATERIALS AND DEPARTMENTAL OVERHEADS OF BHEL.

4.1.1.9
THE CONTRACTOR SHALL PERFORM ANY SERVICES, TESTS ETC, WHICH MAY NOT BE SPECIFIED BUT NEVERTHELESS, REQUIRED FOR THE COMPLETION OF WORK WITHIN QUOTED RATES.

4.1.1.10
THE CONTRACTOR SHALL EXECUTE THE WORK IN THE MOST SUBSTANTIAL AND WORKMANLIKE MANNER. THE STORES SHALL BE HANDLED WITH CARE AND DILIGENCE.

4.1.1.11
BHEL RESERVES RIGHT TO RECOVER FROM THE CONTRACTOR ANY LOSS WHICH ARISES OUT OF UNDUE DELAY / DISCREPANCY / SHORTAGE / DAMAGE OR ANY OTHER CAUSES DUE TO CONTRACTOR'S LAPSE DURING ANY STAGE OF WORK. ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE SHALL HAVE TO BE MADE GOOD BY THE CONTRACTOR.

4.1.1.12
ALL CRANES, TRANSPORT EQUIPMENT, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC, EXCEPT OTHERWISE SPECIFIED AS BHEL SCOPE OF FREE ISSUE, REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR. ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES. THE CONTRACTOR'S QUOTED RATES SHOULD BE INCLUSIVE OF ALL SUCH CONTINGENCIES.

4.1.1.13
DURING THE COURSE OF ERECTION, TESTING AND COMMISSIONING CERTAIN REWORK / MODIFICATION / RECTIFICATION / REPAIR / FABRICATION ETC MAY BECOME NECESSARY ON ACCOUNT OF FEED BACK / REVISION OF DRAWING ETC. THIS WILL ALSO INCLUDE MODIFICATIONS / RE-WORKS SUGGESTED BY BHEL / CUSTOMER / OTHER INSPECTION GROUP. CONTRACTOR SHALL CARRY OUT SUCH REWORK / MODIFICATION / RECTIFICATION / FABRICATION / REPAIR ETC PROMPTLY AND EXPEDITIOUSLY. DAILY LOG SHEETS SIGNED BY BHEL ENGINEER AND INDICATING THE DETAILS OF WORK CARRIED OUT, MAN-HOURS ETC SHALL BE MAINTAINED BY THE CONTRACTOR FOR SUCH REWORKS. CLAIM OF CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY RELEVANT CLAUSES OF SECTION-13.

4.1.1.14
ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF STRUCTURES, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, GOUGING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP ETC AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORKS AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY, SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK WITHIN THE QUOTED RATES.

4.1.1.15
THE CONTRACTOR SHALL MAKE ALL FIXTURES, TEMPORARY SUPPORTS, STEEL STRUCTURES REQUIRED FOR JIGS & FIXTURES, ANCHORS FOR LOAD AND GUIDE PULLEYS REQUIRED FOR THE WORK. CONTRACTOR SHALL ARRANGE NECESSARY STEEL FOR SUCH USAGE. ONLY THE STEEL FOR DRUM LIFTING TEMPORARY STRUCTURE (CAT HEAD) WILL BE PPROVIDE BY BHEL IN RANDOM SIZE MATERIALS AVAILABLE AT SITE.

4.1.1.16
THE CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, AND LUBRICANTS ETC FROM THE BHEL STORES/ STORAGE AREA AFTER GETTING THE APPROVAL OF BHEL ENGINEER ON STANDARD INDENT FORMS OF BHEL. COMPLETE AND DETAILED ACCOUNT OF THE MATERIALS AND EQUIPMENTS AFTER USAGE SHALL BE SUBMITTED TO THE BHEL AND RECONCILED PERIODICALLY.

4.1.1.17
CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE TO ERECTION SITE AND ERECT THEM IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. MATERIALS SHALL BE STACKED NEATLY, PRESERVED AND STORED IN THE CONTRACTOR'S SHED AND AT WORK AREAS IN AN ORDERLY MANNER. IN CASE IT IS NECESSARY TO SHIFT AND RE-STACK THE MATERIALS KEPT AT WORK AREAS/ SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FOR ANY OTHER REASON, SAME SHALL BE DONE BY CONTRACTOR MOST EXPEDITIOUSLY AS INCIDENTAL TO WORK.

4.1.1.18
PLANT MATERIALS SHOULD NOT BE USED FOR ANY TEMPORARY SUPPORTS / SCAFFOLDING/ PREPARING PRE-ASSEMBLY BED ETC.

4.1.1.19
THE DETAILS OF EQUIPMENTS TO BE ERECTED UNDER THIS CONTRACT IS GENERALLY AS PER THE SCHEDULE GIVEN IN RELEVANT APPENDICES. THESE DETAILS ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED. ACTUAL QUANTUM AND TYPE OF EQUIPMENTS WILL BE BASED ON THE RELEVANT ERECTION DOCUMENTS WHICH WILL BE FURNISHED TO THE CONTRACTOR IN DUE COURSE OF ERECTION AND THE WEIGHT AND QUANTITY AS PER THE RELEVANT ENGINEERING DOCUMENTS WILL ONLY BE ADMISSIBLE FOR THE BILLING PURPOSE.

4.1.1.20
HANGERS & SUSPENSIONS, SUPPORTS ETC FOR TUBES, PIPING, & DUCTS ETC WILL BE SUPPLIED IN RUNNING / RANDOM LENGTHS / SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

4.1.1.21
SPRING SUSPENSION/CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS, AS PER BHEL'S DOCUMENTS/INSTRUCTIONS, DURING VARIOUS STAGES OF ERECTION & TESTING AND AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE AS PART OF WORK. THIS EXERCISE MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE ACHIEVED.

4.1.1.22
LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING SHALL BE DONE AS PER SITE REQUIREMENT. NECESSARY SKETCH FOR ROUTING THESE LINES SHOULD BE GOT APPROVED FROM BHEL BY THE CONTRACTOR. THERE IS A POSSIBILITY OF SLIGHT CHANGE IN ROUTING THE ABOVE PIPE LINES EVEN AFTER COMPLETION OF ERECTION.

4.1.1.23
WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, THERMOWELL, THERMOCOUPLE PAD, METAL TEMP PAD AND CLAMPS, ROOT VALVE, CONDENSING VESSEL, FLOW METERING & MEASUREMENT DEVICES, AND CONTROL VALVES TO BE PROVIDED ON BOILER & ITS AUXILIARIES AND PIPING ARE COVERED WITHIN THE SCOPE OF THIS SPECIFICATION. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF:

a) ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.
b) ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

PRE-HEATING, NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

4.1.1.24
CERTAIN INSTRUMENTATION LIKE PRESSURE SWITCHES, AIR SETS, FILTERS, REGULATORS, PRESSURE GAUGES, JUNCTION BOXES, POWER CYLINDERS, DIAL THERMOMETERS, FLOW METERS, VALVE ACTUATORS, FLOW INDICATORS, CENTRIFUGAL/SPEED SWITCHES OF MOTORS, ACCUMULATORS ETC ARE RECEIVED IN ASSEMBLED CONDITION AS INTEGRAL PART OF EQUIPMENTS. CONTRACTOR SHALL DISMOUNT SUCH INSTRUMENTS FOR CALIBRATION AND HAND OVER THE SAME TO BHEL. C & I ERECTION AGENCY WILL DO STORAGE/RE-ERECTION CALIBRATION ETC.

4.1.1.25
FIXING AND SEAL WELDING OF THERMOWELLS & PLUGS BEFORE HYDRO TEST/ STEAM BLOWING OF EQUIPMENT OR OTHER PIPING SYSTEM IS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL ALSO REMOVE THE SEAL WELDED PLUGS BY PROCESS OF GRINDING AND FIX AND SEAL WELD THERMOWELLS AFTER HYDRO TEST/STEAM BLOWING OF LINES AS PART OF WORK.

4.1.1.26
ACTUATORS/DRIVES OF VALVES, DAMPERS, GATES, POWERED VANES ETC MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

4.1.1.27
ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS.

4.1.1.28
IN INSTALLATION OF VARIOUS EQUIPMENTS IT MAY BECOME NECESSARY TO INSTALL THESE ON TEMPORARY SUPPORTS/ HANGER DUE TO VARIOUS REASONS INCLUDING NON-AVAILABILITY OF SUSPENSION MATERIALS. CONTRACTOR SHALL INSTALL SUCH TEMPORARY SUSPENSIONS/HANGERS AND LATER ON SHIFT THE RELEVANT EQUIPMENTS TO THEIR RESPECTIVE PERMANENT HANGERS/ SUSPENSIONS/ SUPPORTS AS INCIDENTAL TO WORK. REQUISITE MATERIALS FOR SUCH TEMPORARY ARRANGEMENTS WILL BE PROVIDED BY BHEL ON FREE -RETURNABLE BASIS WHICH SHALL BE RETURNED TO BHEL AFTER THE USE.

4.1.1.29
THE WORK SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE TO THE “FIELD QUALITY PLAN” APPROVED BY BHEL/CLIENT. CONTRACTOR, JOINTLY WITH BHEL, SHALL PREPARE ALL NECESSARY RECORDS OF MEASUREMENTS/READINGS/ PROTOCOLS ETC.

4.1.1.30
INTERCONNECTION/ HOOKUP, IF ANY, WITH THE EXISTING SYSTEM SHALL FORM PART OF WORK. SUCH INTERCONNECTIONS, HOOKUPS MAY REQUIRE SHUT DOWN OF RUNNING PLANT AND THE RELEVANT WORK HAVE TO BE COMPLETED WITHIN SUCH PLANNED SHUTDOWNS. THIS MAY CALL FOR WORKING WITH ENHANCED RESOURCES AND ON EXTENDED HOURS. CONTRACTOR'S OFFER SHALL COVER ALL SUCH CONTINGENCIES.

4.1.1.31
IT MAY SO HAPPEN THAT CERTAIN COMPONENTS LIKE MANHOLE DOORS , HANGER ETC MAY BE SUPPLIED IN LOOSE ITEMS. THEY NEED TO BE ASSEMBLED AS PER RELEVENT DRAWINGS OR AS

PER ADVISE OF BHEL ENGINEER PRIOR TO ERECTION. THIS FORMS THE PART OF THE SCOPE OF WORK.

4.2 DETAILS OF SCOPE OF WORK FOR BOILER & AUXILIARIES & PIPING

THE SCOPE OF WORK IS FURTHER DETAILED IN THE SPECIFICATIONS HEREINAFTER.

4.2.1 PRESSURE PARTS

A) INSTALLATION OF TEMPORARY STRUCTURE FOR DRUM LIFTING IS IN THE SCOPE OF THE CONTRACTOR'S WORK. THE REQUIRED STEEL FOR THE PURPOSE WILL BE PROVIDED IN RANDOM SIZES BY BHEL FREE OF CHARGE. THESE SHALL BE FABRICATED TO SUIT THE REQUIREMENT, ERECTED AND WELDED AS PART OF WORK. NDT HAS TO BE CARRIED OUT AS PER INSTRUCTIONS. THESE STRUCTURES HAVE TO BE DISMANTLED AT APPROPRIATE STAGE AND RETURNED TO BHEL AS PER THE INSTRUCTIONS OF BHEL ENGINEER. ALSO, THE RELEVANT AREA OF PERMANENT STRUCTURES HAVE TO BE FINISHED AS INSTRUCTED/ AS PER RELEVANT CODES OF PRACTICE. PAYMENT FOR ABOVE WILL BE MADE AT THE RATE ACCEPTED FOR STRUCTURES; NO SEPARATE PAYMENT WILL BE MADE FOR FABRICATION, DISMANTLING AND FINISHING WORK AND RETURN OF MATERIALS.

BOILER DRUM IS TO BE LIFTED USING STRAND JACK METHOD. CONTRACTOR TO ENGAGE SERVICES OF EXPERT AGENCY TO LIFT THE BOILER DRUM BY THIS METHOD. CONTRACTOR SHALL DEPLOY THE EXPERT AGENCY AND OTHER RESOURCES WELL IN TIME TO SUIT THE MILESTONE REQUIRMENT.

SOME OF THE RENOWNED AGENCIES WHO CAN PROVIDE STRAND AND JACK LIFTING ARRANGEENT ARE –

1 M/S FAGIOLI PSE INDIA PVT LTD (203, KRISHNA BHAVAN, GOVANDI STATION ROAD, DEONAR, MUMBAI 400 088, TELPHONE NO 022 – 25564388, FAX NO 022 – 25562565)

2 M/S FREIGHT WINGS (P) LTD, (309, REX CHAMBERS, WALCHAND HIRACHAND MARG, BALLARD ESTATE, MUMBAI 400 001, TELPHONE NO 022 – 22631714, 22632261, 22639988)

3 M/S DORMAN LONG TECHNOLOGY LTD, (233 BHARAT INDUSTRIAL ESTATE, LAL BAHADUR SHASTRI MARG, BHANDUP (WEST), MUMBAI 400 078, TELEPHOHE NO 022 – 25961960, Mo 09820192807)

4 M/S BASU AND BASU ENGINEERS PVT LIMITED, KOLKATA, TELEPHONE NO 033 – 24642967, 24664069, FAX 033 – 24664621)

5 M/S LIFT AND SHIFT INDIA PRIVATE LIMITED (96 CHEMBUR, MANKHURD LINK ROAD, MUMBAI 400 043, TELEPHONE 022 – 25484180, 25560101, FAX 022 – 25563573, E-MAIL – projects@liftandshift.co.in)

CONTRACTOR MAY ENGAGE ANY OF THE ABOVE NAMED AGENCIES OR ANY OTHER COMPETENT AGENCY KNOWN TO CONTRACTOR FOR THIS LIFTING ACTIVITY.

PRIOR APPROVAL OF BHEL IS TO BE TAKEN BEFORE ASSIGNING THE WORK TO THE AGENCY.

B) PRESSURE PARTS COMPONENTS LIKE HEADERS, PANELS, COILS, LOOSE TUBES ETC HAVE TO BE FLUSHED/BLOWN WITH COMPRESSED AIR, CHECKED FOR DIMENSIONAL ACCURACY AND CONFIGURATION AND MINOR RECTIFICATIONS, IF NECESSARY WILL HAVE TO BE DONE BEFORE ERECTION. THIS WILL INVOLVE MAKING APPROPRIATE BED OF STEEL STRUCTURES OVER THE CONCRETE BLOCKS/ STEEL PEDESTALS. NECESSARY STEEL, CONCRETE BLOCKS SHALL BE ARRANGED BY THE CONTRACTOR. BED SHALL BE FABRICATED AS PER BHEL REQUIREMENT.

C) NORMALLY THE HIGH PRESSURE VALVES WILL HAVE PREPARED EDGES FOR WELDING. BUT, IF IT BECOMES NECESSARY, THE CONTRACTOR SHALL PREPARE NEW EDGES OR RECONDITION THE EDGES BY GRINDING OR CHAMFERING TO MATCH THE CORRESPONDING TUBES AND PIPES. NO GAS CUTTING WILL BE PERMITTED. ALL FITTINGS LIKE "T" PIECES, WELD NECK

FLANGES, REDUCERS, ETC SHALL BE SUITABLY MATCHED WITH PIPES FOR WELDING (THIS IS APPLICABLE TO PIPING WORK ALSO).

D) WELDING OF ALL ATTACHMENTS ON PRESSURE PARTS INCLUDING THOSE REQUIRED FOR INSULATION WORK IS IN THE SCOPE OF WORK.

E) SURFACES INSIDE SEAL BOX AND OTHER AREAS THAT ARE TO BE APPLIED WITH CASTABLE REFARCTORY LINING SHALL BE PAINTED WITH BLACK BITUMEN PAINT BEFORE BOXING UP AND APPLICATION OF REFRACTORY. SEAL BOXES NEED TO BE PARTIALLY CUT OPEN IN ORDER TO POUR REFRACTORY. CONTRACTOR SHALL CARRY OUT NECESSARY CUTTING AND SEAL WELDING OF SUCH CUTOUTS. CONTRACTOR SHALL PROVIDE THE BLACK BITUMEN PAINT OF REQUIRED SPECIFICATION FOR SUCH APPLICATIONS.

F) FURNACE AREA AND HEAT RECOVERY AREA OF FLUE GAS PASSAGE HAS TO BE MADE LEAK PROOF BY SEAL WELDING. AIR LEAK TEST BY PRESSURIZATION HAS TO BE CONDUCTED TO PROVE EFFECTIVENESS OF THE SEAL WELD AND SOAP BUBBLE OR ANY OTHER SIMILAR TEST WILL HAVE TO BE CARRIED OUT FOR THE ENTIRE SEAL WELDS TO ASCERTAIN THE EFFECTIVE SEALING IS ACHIEVED. THE TESTS MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULT IS ACHIEVED.

G) IF REQUIRED, THE PRESSURE PARTS, AFTER INITIAL ERECTION AND TESTS, WILL HAVE TO BE PRESERVED BY EITHER DRY OR WET PRESERVATION PROCEDURE. CONTRACTOR SHALL ERECT THE PIPING & VALVES AND PROVIDE NECESSARY ASSISTANCE FOR THE SAME. REQUIRED PIPING, VALVES AND PRESERVATIVE (GAS/CHEMICALS) WILL BE PROVIDED BY BHEL AS FREE ISSUE.

H) THE DRUM INTERNALS, IF ALREADY INSTALLED, MAY HAVE TO BE REMOVED TO FACILITATE INSPECTION BY STATUTORY AUTHORITIES AND CHEMICAL CLEANING. THE DRUM INTERNALS ARE TO BE PRESERVED PROPERLY AND RE-FITTED AT APPROPRIATE STAGE AS PART OF WORK.

I) SUPERHEATER AND/OR REHEATER SYSTEM WILL HAVE HP BUTT WELD JOINTS OF T-91 MATERIAL. WELDING OF THESE HP JOINTS SHALL INVOLVE PRE-HEATING AND POST HEATING BY RESISTANCE HEATING, ARGON PURGING OF JOINTS DURING WELDING PROCESS AND FULL TIG WELD. CONTRACTOR SHOULD FOLLOW REQUIRED PROCEDURE FOR T91 WELDING NDT, ETC.

J) BOILER DRUM : BOILER DRUM MAY NEED TO BE LED FROM THE POINT OF UNLOADING TO THE CAVITY OF BOILER. THE SAME IS IN THE CONTRACTOR'S SCOPE AND SHALL MAKE ALL ARRANGEMENTS, INCLUDING FABRICATION OF SADDLE IF REQUIRED. STRUCTURAL MATERIALS REQUIRED FOR THE SAME WILL BE PROVIDED BY BHEL ON FREE-RETURNABLE BASIS.

K) CORRECTIONS IN THE PROFILES OF SCALLOPED PLATES/BARS, SKIN CASING, SEAL PLATES ETC. FOR PROPER MATCHING WITH MATING PARTS, WHEREVER REQUIRED, SHALL BE DONE AS INCIDENTAL TO THE WORK.

4.2.2 TRIM & INTEGRAL PIPING OF BOILER AND CRITICAL PIPING

4.2.2.1

THE WORK ON VARIOUS PIPING SYSTEMS WILL INCLUDE CUTTING TO REQUIRED LENGTH, EDGE PREPARATION, LAYING, FIXING & WELDING OF THE PIPES / ELBOWS / FITTINGS/ VALVES ETC. IN THE PIPELINE, FIXING & ADJUSTMENT OF SUPPORTS / ANCHORS / SHOCK ABSORBERS AND CARRYING OUT ALL OTHER ACTIVITIES / WORK TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING / COMMISSIONING OPERATIONS MENTIONED IN THE SPECIFICATION AS PER BHEL ENGINEERS INSTRUCTIONS AND / OR AS PER APPROVED DRAWINGS / DOCUMENTS.

4.2.2.2
TUBES OR PIPES WHEREVER DEEMED CONVENIENT, WILL BE SENT IN RANDOM LENGTHS. THESE SHALL BE CUT AND EDGE PREPARED TO SUIT THE SITE CONDITIONS AND THE LAYOUTS. FITTINGS LIKE BENDS TEES, ELBOWS, REDUCERS, FLANGES ETC WILL BE SUPPLIED AS LOOSE ITEMS. HOWEVER, BENDS OF TUBE SIZE UP TO Nb. 65mm WILL HAVE TO BE FORMED AT SITE AS INCIDENTAL TO WORK.

4.2.2.3
ALL DRAINS / VENTS / RELIEF/ ESCAPE / SAFETY VALVE EXHAUST PIPING ETC TO VARIOUS TANKS / SEWAGE / DRAIN CANAL / FLASH BOX / SUMP / ATMOSPHERE ETC FROM THE STUBS ON THE PIPING AND EQUIPMENTS ARE COVERED IN THE SCOPE OF WORK.

4.2.2.4
CONNECTION (EITHER FLANGED, BOLTED OR WELDED) OF PIPING TO THE TERMINAL POINTS/EQUIPMENTS ETC IS IN THE SCOPE OF WORK EVEN THOUGH SUCH TERMINAL POINT/EQUIPMENT MAY NOT FORM PART OF THIS WORK. ALL NDE INCLUDING RADIOGRAPHY OF JOINTS SO MADE, POST-WELD-HEAT-TREATMENT IF ANY, ARE ALSO WITHIN THE SCOPE OF WORK/SPECIFICATION. THE TERMINAL POINTS WORK IS INCLUSIVE OF CUTTING OF EXISTING LINES, IF REQUIRED, EDGE PREPARATION, WELDING/BLANKING AND HOOK UP WORK.

4.2.2.5
IT SHOULD BE ENSURED THAT ALL THE TERMINAL POINT CONNECTIONS ARE DONE WITHOUT TRANSFERRING ANY UNDUE LOAD OR STRAIN TO THE OTHER EQUIPMENTS. NECESSARY PROTOCOLS HAVE TO BE PREPARED FOR SUCH FIT-UP ALONGWITH BHEL/CUSTOMER REPRESENTATIVE BEFORE CONNECTING. ALL NDE INCLUDING RADIOGRAPHY OF JOINTS SO MADE, POST WELD HEAT TREATMENT IF ANY, IS ALSO WITHIN THE SCOPE OF WORK/ SPECIFICATION.

4.2.2.6
MECHANICAL FREENESS OF VALVES HAVE TO BE ENSURED PRIOR TO ERECTION.

4.2.2.7
THE ABOVE PROVISIONS SHALL BE APPLICABLE, MUTATIS - MUTANDIS, TO OTHER PIPING SYSTEMS e.g. FUELOIL PIPING, LUB OIL PIPING OF ROTATING M/c ACW LINES ETC.

4.2.2.8
MAIN STEAM PIPING UPTO TURBINE STOP VALVE RELEASED IN PG 80 IS INCLUDED IN THE SCOPE OF WORK. THE MATERIAL WILL BE SA-335 P-91. BIDDER SHALL FOLLOW BHEL APPROVED PROCEDURE FOR WELDING, PRE HEATING, PWHT & NDT OF SA-335 P-91 MATERIAL. DETAILED PROCEDURE WILL BE ISSUED TO THE CONTRACTOR.

4.2.2.9 FOLLOWING ITEMS OF WORK SHALL ALSO FORM PART OF PIPING ERECTION:

1. INSTALLATION & REMOVAL OF ISOLATING DEVICES/ NRVs AND REMOVAL & RE-FIXING OF INTERNALS REQUIRED FOR HYDRAULIC TESTING, PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES. REQUIRED GASKETS WILL BE SUPPLIED BY BHEL FREE OF COST.

2. MATCHING OF FLANGES FOR ACHIEVING PARALLELISM AND ALIGNMENT RESORTING TO HEAT CORRECTION OR OTHER SUITABLE METHODS AS PER INSTRUCTIONS OF BHEL ENGINEERS.

3. TO LOCATE THE CAUSE OF VIBRATIONS IN PUMPS OR OTHER AUXILIARIES AND TO CARRY OUT NECESSARY CORRECTIONS IN PIPING AND ITS SUPPORTS. THIS MAY INVOLVE CUTTING, FRESH EDGE PREPARATION, WELDING, RADIOGRAPHY, STRESS RELIEVING, ETC., OF SUCTION, DISCHARGE, RE-CIRCULATING AND OTHER CONNECTED PIPING AND ITS SUPPORTS AT A NUMBER OF PLACE.

4. FABRICATION AND ERECTION OF RACKS AND STEEL SUPPORTS FOR ALL THE PIPING INCLUDING CRITICAL PIPING. STEEL FOR THIS PURPOSE WILL BE SUPPLIED BY BHEL.

5. ERECTION, WELDING, NDE AND STRESS RELIEVING OF CERTAIN EQUIPMENTS, E.G. FLOW NOZZLES, CONTROL VALVES ETC, AFTER COMPLETION OF CERTAIN ACTIVITIES E.G. CHEMICAL CLEANING, STEAM BLOWING ETC IS PART OF WORK. THIS MAY INVOLVE REMOVAL OF PORTIONS FROM THE ALREADY ERECTED PIPELINES IN ORDER TO INTRODUCE THESE EQUIPMENTS AND RESULTANT EDGE PREPARATION ETC SHALL BE INCIDENTAL TO WORK. NO SEPARATE/ ADDITIONAL PAYMENT IS ENVISAGED FOR CUTTING, WELDING AND EDGE PREPARATION IN THIS REGARD. THE REMOVED PIECES OF PIPES SHALL BE RETURNED TO BHEL STORES WITH PROPER CLEANING, DRESSING AND IDENTIFICATION MARKING.

6. WELDING OF ROOT VALVES WITH SMALL LENGTH OF PIPING TO THE PRESSURE, FLOW AND LEVEL TAPPING POINTS ON PIPING OR FLOW NOZZLES / ORIFICES / METERING ELEMENTS FIXED ON PIPING.

7. OPENING OF VALVE ACTUATORS, DISMANTLING OF ACTUATORS FROM THE VALVES, REFITTING AND RENDERING ASSISTANCE CONNECTED WITH THE ELECTRICAL AND MECHANICAL PROBLEMS.

8. FIXING AND WELDING INCLUDING DUE NDE & PWHT ETC OF CARRIER PLATES ON TO THE PIPES.

4.2.2.10
AS FAR AS POSSIBLE PRE-ASSY OF PIPING ON GROUND IS TO BE DONE. THE ERECTION OF VARIOUS PIPING MAY HAVE TO BE STARTED FROM ANY RANDOM REFERENCE INSTEAD OF THE TERMINAL POINTS INORDER TO MEET CERTAIN COMPLETION COMMITMENTS.

4.2.2.11
THE LOCATION OF DRAIN HEADERS, VALVES, STATIONS, STEAM TRAPS OF PIPING AS INDICATED IN THE BHEL DRAWINGS ARE SUGGESTIVE ONLY. THE FINAL LOCATION AND ROUTINGS SHALL BE DECIDED TO SUIT THE SITE CONDITIONS. WHILE ROUTING SUCH LINES AND FIXING THE STATIONS, IT HAS TO BE ERECTED SO AS TO PROVIDE EASY ACCESSIBILITY AND FREE PATH FOR THE PURPOSE OF EASY OPERATION AND MAINTENANCE. THESE LOCATIONS SHALL BE ACCEPTABLE TO THE CLIENT. SOMETIMES, THE LOCATIONS OF STATIONS AND ROUTING OF LINES MAY HAVE TO BE CHANGED AS PER THE SITE CONDITIONS. ALL SUCH WORKS SHALL BE CARRIED OUT EXPEDITIOUSLY AS PER THE INSTRUCTIONS OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER IS FINAL AND BINDING ON THE CONTRACTOR.

4.2.2.12
THE RATE QUOTED IN RATE SCHEDULE IS ALSO INCLUSIVE OF PRE-HEATING, WELDING, POST HEATING, POST WELD HEAT TREATMENT/ STRESS RELIEVING AND NDE OF PIPING.

4.2.2.13
ERECTION OF PIPING SYSTEMS SHALL INVOLVE CO-ORDINATION WITH THE ERECTION OF THE TURBINE, TURBO-GENERATOR, CONDENSER, BOILER, BOILER FEED PUMPS AND OTHER MAJOR EQUIPMENTS. WHEREVER REQUIRED, APPROVAL OF CONCERNED BHEL ENGINEER/OTHER ERECTION AGENCY MUST BE OBTAINED PRIOR TO MAKING PIPING INTERFACE CONNECTIONS TO SUCH EQUIPMENTS. SEQUENCE OF WORK SHALL BE CAREFULLY PLANNED TO MINIMIZE INTERFERENCE WITH OTHER GROUPS WORKING IN THE SAME AREA. ACTUAL SEQUENCE TO BE FOLLOWED SHALL BE SUBJECT TO THE APPROVAL OF BHEL ENGINEER AND BHEL ENGINEER MAY DIRECT THE CONTRACTOR TO RESCHEDULE HIS WORK TO SUIT THE STATUS OF THE SITE WORK.

4.2.2.14
WHILE ERECTING THE FIELD RUN PIPES, THE CONTRACTOR SHALL CHECK THE ACCESSIBILITY OF VALVES, INSTRUMENTS TAPPING POINTS AND MAINTAIN MINIMUM HEAD ROOM REQUIREMENT

AND OTHER NECESSARY CLEARANCE FROM THE ADJOINING WORK AREAS TO AVOID INTERFERENCES.

4.2.2.15

ALL PIPELINES SHALL BE GIVEN PROPER SLOPE TOWARDS THE DRAIN POINTS DURING ERECTION. FOR MAINTAINING THE SLOPES AS GIVEN IN THE DRAWINGS FOR LARGER THICKNESS AND LARGER DIA PIPELINES, EDGE PREPARATION FOR WELDING MAY HAVE TO BE ALTERED SUITABLY TO ACHIEVE THE SLOPE.

4.2.2.16

ALL PIPELINES SHALL BE PROVIDED, AS PER THE INSTRUCTIONS OF BHEL ENGINEER, WITH SUITABLE VENT AND THE DRAIN POINTS WITH VALVE (S) ON THE HIGHEST AND LOWER POINTS OF THE PIPE RUN ALTHOUGH MAY NOT BE SPECIFICALLY MENTIONED IN THE DRAWING.

4.2.2.17

IT MAY BECOME NECESSARY TO MAKE & INSTALL TEMPORARY SPOOL PIECES FOR CERTAIN PROCESS REQUIREMENTS. CONTRACTOR'S SCOPE SHALL INCLUDE PREPARATION, ERECTION, FIT-UP, WELDING, NDE ETC AND DISMANTLING OF SUCH SPOOL PIECES AT APPROPRIATE STAGE WITHOUT ANY ADDITIONAL PAYMENT.

4.2.2.18

IN PIPELINES LIKE CRH LINES, EXTRACTION LINES, ETC., THE NRVS, STRAINERS ETC WILL BE ERECTED BY OTHER ERECTION AGENCY. ALIGNMENT OF THESE VALVES TO MATCH THE PIPE ENDS (BOTH SIDES), WELDING, HEAT TREATMENT AND NDE ETC IS IN THE SCOPE AS INCIDENTAL TO WORK.

4.2.2.19

NORMALLY, HANGERS SETTING IN COLD CONDITION ARE DONE BY SIMULATION ADDING ADDITIONAL TEMPORARY WEIGHT, WHICH WILL BE ROUGHLY EQUAL TO THE WEIGHT OF THE INSULATION. ATTACHMENT OF TEMPORARY WEIGHTS AND FLOATING OF THE JOINTS IN THE SIMULATION TEST TO BE TREATED AS PART OF JOB. HANGER SETTINGS HAVE TO BE REPEATED FOR ACHIEVING FREE-FLOATING JOINTS. HANGER ADJUSTMENTS TO BE REPEATED FOR STEAM BLOWING BY RESETTING HOT AND COLD VALUES IF REQUIRED. THIS MAY HAVE TO BE REPEATED SEVERAL TIMES AFTER STEAM BLOWING AND SYNCHRONIZATION. THE WEIGHTS WILL BE SUPPLIED BY BHEL. CONTRACTOR HAS TO TRANSPORT FROM BHEL STORES AND RETURN THE SAME AFTER COMPLETION OF WORK. NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED.

4.2.3 ROTATING MACHINERY

A) SPECIFICATIONS COVERED UNDER THE FOLLOWING PARA AND ALSO OTHER RELEVANT SPECIFICATIONS CONTAINED IN OTHER PARAS ELSEWHERE IN THIS TENDER DOCUMENT WILL BE APPLICABLE FOR ROTATING MACHINES LIKE FD / ID / PA / SEAL AIR FANS, BLOWERS, COAL MILLS, FUEL FEEDERS, HP & LP DOSING PUMP SKIDS AND OTHER SIMILAR AUXILIARIES.

B) ALL LUBRICANTS FOR TESTING, PRESERVATION AND LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS SHALL BE SUPPLIED BY BHEL AS FREE ISSUE. ALL SERVICES INCLUDING LABOUR SHALL BE PROVIDED BY THE CONTRACTOR FOR DRAWING THESE FROM BHEL / CUSTOMER'S STORES, TRANSPORTING, HANDLING, FILLING, EMPTYING, RE-FILLING, ACCOUNTING AND RETURN OF SURPLUS LUBRICANTS / EMPTY CONTAINERS / OLD & USED LUBRICANTS AFTER DRAINING ETC. CONTRACTOR SHOULD CLEAN THE SPILLED / LEAKING LUBRICANTS THOROUGHLY, CONSUMABLES FOR SUCH CLEANING WILL BE IN CONTRACTOR'S SCOPE.

C) ALL ROTATING MACHINERY AND EQUIPMENTS SHALL BE CLEANED, LUBRICATED, CHECKED FOR THEIR SMOOTH ROTATION, IF NECESSARY, BY DISMANTLING AND RE-FITTING BEFORE ERECTION. ALSO, THE EQUIPMENTS MAY HAVE TO BE CHECKED FOR CLEARANCES, TOLERANCES AT ANY STAGE OF THE WORK INCLUDING DURING TESTING, COMMISSIONING ETC. SHAFT OF THE ROTATING MACHINES SHALL BE ROTATED PERIODICALLY TO AVOID DAMAGES. ALL THESE SHALL BE PART OF WORK.

D) TRIAL RUN OF THE DRIVES IN UN-COUPLED STATE AND THEN COUPLED WITH EQUIPMENT HAS TO BE DONE AFTER NECESSARY ALIGNMENT.

E) FORCED LUBE OIL SYSTEMS INCLUDING LUBE OIL PIPING OF DRIVES, ROTATING EQUIPMENTS ETC FORM PART OF THE WORK UNDER THESE SPECIFICATIONS. HYDRAULIC TEST OF OIL COOLERS, OIL PIPING ETC ARE IN THE SCOPE OF WORK. WHERE REQUIRED COOLER MAY HAVE TO BE DISMANTLED FOR HYDRAULIC TEST AND RE-ERECTED THEREAFTER AS PART OF WORK.

F) CERTAIN ROTATING MACHINERY, AFTER TESTING, PRE-COMMISSIONING MAY HAVE TO BE RE-ALIGNED/HOT ALIGNED AND VITAL CLEARANCES RE-SET. THIS MAY NECESSITATE DISCONNECTION OF CABLING, REMOVAL OF CERTAIN INSTRUMENTS ETC AND RESTORATION THEREAFTER.

G) PROTECTIVE LUBRICANT COATS / FILL PROVIDED ON / IN THE CRITICAL AREA OF EQUIPMENTS HAVE TO REMOVED AT APPROPRIATE STAGE AND REGULAR LUBRICANTS, AFTER REMOVAL / CLEANING OF PROTECTIVE COAT / FILL, AS PER SPECIFICATIONS SHOULD BE FILLED / APPLIED. CLEANING / FLUSHING AGENTS / OILS WILL BE PROVIDED BY BHEL.

H) CHEMICAL CLEANING, STEAM BLOWING AND AIR DRYING OF THE CONNECTING PIPES FOR THE LUBE OIL SYSTEM HAS TO BE CARRIED OUT WHEREVER REQUIRED AS PER INSTRUCTION MANUALS / DRAWINGS. CHEMICALS, SUITING BHEL SPECIFICATION, FOR SUCH CHEMICAL CLEANING IS IN THE SCOPE OF CONTRACTOR.

I) EVENTHOUGH ROTATING MACHINES MAY BE GROUTED TO FOUNDATION USING NON-SHRINK GROUT MIX, BLUE MATCHING OF PACKER PLATES / SHIMS WITH FOUNDATION / BETWEEN PACKERS / EQUIPMENT BASE SHOULD BE DONE AS INCIDENTAL TO WORK WHEREVER INSTRUCTED BY BHEL ENGINEER.

J) SKID MOUNTED EQUIPMENTS MAY NEED CHECKING, RE-SETTING DUE TO VARIOUS REASONS AS INCIDENTAL TO WORK.

K) THERE ARE 3 NOS OF BALL MILLS.

4.2.4 ERECTION OF ELECTROSTATIC PRECIPITATOR

4.2.4.1
WHEREVER CALLED FOR, PRE-ASSEMBLY OF SUPPORTING STRUCTURES, CASING WALLS HAVE TO BE DONE, ON GROUND.

4.2.4.2
LOADING OF COLLECTING ELECTRODES EITHER FROM TOP OR BOTTOM, TO BE DECIDED SUITING SITE CONDITIONS, SHALL BE DONE WITH DUE CARE AS PER INSTRUCTIONS.

4.2.4.3
STRAIGHTNESS OF ALL COLLECTING ELECTRODES HAS TO BE CHECKED ON GROUND PRIOR TO LOADING IN TO THE FIELD.

4.2.4.4
BUNDLE OF COLLECTING ELECTRODES SHOULD BE HANDLED ONLY WITH SPECIAL LIFTING BEAM AND SLINGS SUPPLIED FOR THE PURPOSE.

4.2.4.5
BHEL WILL SUPPLY HUCK BOLTING M/C WITH NECESSARY AUXILIARIES FREE OF CHARGES. HOWEVER, ELECTRICAL CONNECTIONS, OPERATION ETC SHALL BE ARRANGED BY THE CONTRACTOR.

4.2.4.6
CLEARANCES AS PRESCRIBED AMONGST COLLECTING ELECTRODES AND WITH CASING WALLS HAVE TO BE MAINTAINED. SPOT HEATING OF COLLECTING ELECTRODES, WHEREVER CALLED FOR, SHALL BE DONE AS PART OF WORK TO ACHIEVE THE REQUIRED CLEARANCES.
4.2.4.7
ERECTION, ALIGNMENT/ FIXING IN FINAL POSITION, OF HIGH VOLTAGE RECTIFIERS OF ESP IS IN THE SCOPE OF WORK. HOWEVER TESTING & COMMISSIONING WILL BE DONE BY OTHER AGENCY.

4.2.4.8
INSTALLATION OF HIGH VOLTAGE INTERLOCKS (EXCEPTING ROTARY SWITCH INTERLOCK OF SWITCHGEAR PANELS) IS IN THE SCOPE OF WORK.

4.2.4.9
COMPLETE ERECTION, ALIGNMENT, TESTING, PRE-COMMISSIONING AND COMMISSION ETC FOR DRIVE MOTORS OF COLLECTING ELECTRODES AND EMITTING ELECTRODE RAPPING MECHANISM IS IN THE SCOPE OF WORK.

4.2.4.10
APPLICATION OF THERMAL INSULATION (MINERAL WOOL MATTRESSES) BETWEEN THE INNER ROOF AND OUTER ROOF IS PART OF WORK UNDER THIS SOCPE. PAYMENT WILL BE MADE FOR THIS INSULATION AT THE ACCEPTED RATE FOR ESP.

4.2.4.11 AIR LEAK TEST

AFTER ERECTION OF ESP AND BEFORE CLEARING FOR INSULATION, AIR LEAK TEST HAS TO BE CARRIED OUT. NECESSARY EQUIPMENT LIKE, AIR BLOWER, VENTURY, DUCTING, AND INSTRUMENTATION ETC. WILL BE PROVIDED BY BHEL FREE OF CHARGES. HANDLING AT STORES, TRANSPORT, ERECTION, COMMISSINONING AND CARRYING OUT THE LEAKAGE TEST, ATTENDING TO THE LEAKAGES TILL SATISFACTORY SEALING / LEAK PROOFNESS SHALL BE IN SCOPE OF THE WORK. CONTRACTOR SHALL DISMANTLE THE TEST EQUIPMENTS AND RETURN TO BHEL STORES IN GOOD CONDITION AFTER DUE RECONCILIATION, CLEANING AND SERVICING. NO SEPARATE/ ADDITIONAL PAYMENT IS ENVISAGED FOR THE ABOVE.

4.2.5
MAIN SUPPORTING STRUCTURES, EXTERNAL STRUCTURES, ELEVATOR STRUCTURES, STAIRWAYS, GALLERIES & PLATFORMS & HANDLING ARRANGEMENT

4.2.5.1
BOILER MAIN SUPPORTING STRUCTURES HAS TO BE ERECTED IN A SEQUENTIAL MANNER.

4.2.5.2
QUALITY NORMS WITH REGARD TO VERTICALITY OF COLUMN, INTER-ALIA, HAVE TO BE ADHERED TO STRICTLY, AT VARIOUS STAGES OF ERECTION.

4.2.5.3
STIFFENING/STRENGTHENING OF MAIN SUPPORTING STRUCTURE, IF ANY, DUE TO DEVIATION IN VERTICALITY OF COLUMNS POST DRUM LIFTING, SHALL BE CARRIED OUT, INCLUDING FABRICATION, IF ANY. NECESSARY STEEL FOR THIS WILL BE PROVIDED IN RANDOM SIZES BY BHEL AS FREE ISSUE. PAYMENT FOR SUCH STIFFENING/ STRENGTHENING SHALL BE MADE FOR WEIGHT CERTIFIED BY BHEL ENGINEER AT THE ITEM RATE APPLICABLE TO STRUCTURES, PROVIDED THE DEVIATION HAS OCCURED FOR THE REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR.

4.2.5.4
EACH OF THE CEILING GIRDERS WILL BE SENT IN 2 PIECES AND WILL HAVE TO BE ASSEMBLED, WELDED A ND NDE & PWHT (SR) DONE ON GROUND PRIOR TO THEIR ERECTION IN POSITION.

4.2.5.5
IT IS LIKELY THAT, IN DEVIATION FROM PRESCRIBED SEQUENCE, ERECTION OF CERTAIN ELEMENTS OF STRUCTURE MAY BE DEFERRED FOR LATER STAGE, TO FACILITATE, SAY CRANE BOOM REACH TO HIGHER ELEVATION, PASSAGE OF DRUM DURING DRUM LIFTING ETC. THIS MAY NECESSITATE TEMPORARY INSTALLATION OF SOME STRUCTURAL STEELS AT APPROPRIATE LOCATIONS TO KEEP THE STABILITY OF STRUCTURE INTACT. SUCH TEMPORARY INSTALLATIONS SHALL BE REMOVED SUBSEQUENTLY AND RETURNED TO BHEL STORES/ STORAGE YARD. FINISHING WORK IN THE RELATED PERMANENT STRUCTURES SHALL BE DONE AS PER THE INSTRUCTION OF BHEL ENGINEER. BHEL WILL PROVIDE NECESSARY STEELS ON FREE ISSUE BASIS IN RANDOM SIZES FOR SUCH INSTALLATIONS, WHICH SHALL BE FABRICATED BY THE CONTRACTOR TO SUIT THE REQUIREMENT.

PAYMENT FOR SUCH INSTALLATIONS SHALL BE MADE ON THE ACCEPTED TONNAGE RATE OF STRUCTURES. NO SEPARATE PAYMENT WILL BE MADE FOR FABRICATION, REMOVAL & RETURN OF THE MATERIALS TO BHEL STORES.

4.2.5.6
IN SOME CASES, THE STRUCTURAL MATERIAL WILL BE SUPPLIED IN RANDOM LENGTHS, WHICH HAVE TO BE FABRICATED TO SUIT THE REQUIREMENT AS INCIDENTAL TO WORK. ALSO, IT MAY SOMETIMES BE NECESSARY TO REMOVE SOME OF THE ERECTED MEMBERS TO FACILITATE ERECTION OF BIGGER/ PRE-ASSEMBLED EQUIPMENTS. IN SUCH CASES, THE REMOVAL AND RE-ERECTION OF SUCH MEMBERS AS AGREED BY THE BHEL ENGINEER, WILL HAVE TO BE DONE BY THE CONTRACTOR AS INCIDENTAL TO WORK.

4.2.5.7
CONTRACTOR SHALL ARRANGE MATERIALS REQUIRED FOR TEMPORARY CAT LADDERS & WORKING PLATFORMS DURING ERECTION OF COLUMNS, PLATFORMS AND OTHER STRUCTURAL COMPONENTS. SUCH ARRANGEMENTS SHALL, AS FAR AS POSSIBLE, BE ONLY OF CLAMPING & BOLTING TYPE, AS WELDING ON COLUMNS ETC WILL NOT BE PERMITTED. AFTER THE COMPLETION OF WORK THESE SHALL BE REMOVED.

4.2.5.8
ALL THE HAND RAILS AND TOE GUARDS SHALL BE PROVIDED AS PER DRAWINGS AND SITE REQUIREMENT. HAND RAILS SUPPLIED IN RUNNING LENGTHS SHALL BE SUITABLY CUT, EDGE PREPARED AND WELDED. ALSO, HAND RAILS/ GUARDS MAY HAVE TO BE PROVIDED FROM THE SAFETY POINT OF VIEW IN CERTAIN PLACES THOUGH NOT INDICATED IN THE ERECTION DRAWINGS. THE WELD JOINTS OF HAND RAILS SHALL BE GROUND SMOOTH TO FLUSH FINISH.

4.2.5.9
ELECTROFORGED FLOOR GRILLS WILL BE SUPPLIED FOR THIS PROJECT. THESE MAY HAVE TO BE CUT TO SUIT REQUIREMENT. CUTTING SHALL BE DONE ONLY BY MECHANICAL CUTTERS **AND NOT BY GAS CUTTING**. COLD GALVANIZING COMPOUND IS TO BE APPLIED ON THE CUT SURFACE/EDGE. COLD GALVANIZING PAINT WILL BE SUPPLIED BY BHEL FREE OF COST.

FIXING OF FLOOR GRILLS SHALL BE DONE BY SELF-TAPPING SCREWS **AND NOT BY WELDABLE STUDS.** SPECIAL PURPOSE ELECTRICALLY OPERATED HAND TOOLS ARE AVAILABLE IN THE MARKET FOR THIS, WHICH DRILLS, TAPS AND FIXES THE SCREWS IN A SINGLE OPERATION. BHEL WILL SUPPLY THE NECESSARY SELF-DRILLING-CUM-TAPPING SCREWS ANS FIXING CLIPS. CONTRACTOR SHALL DEPLOY THE **DRILLING CUM FIXING MACHINE** REQUIRED FOR THIS PURPOSE AS A REGULAR SCOPE OF WORK.

4.2.5.10
THE CONTRACTOR SHALL ALSO INSTALL ADDITIONAL PLATFORMS OF PERMANENT NATURE FOR APPROACHING DIFFERENT EQUIPMENT AS PER THE SITE REQUIREMENT AND TO MEET O&M REQUIREMENTS, THOUGH THESE MAY NOT INDICATED IN THE ERECTION DRAWINGS. MATERIALS REQUIRED FOR SUCH PLATFORMS WILL BE SUPPLIED BY BHEL IN RANDOM SIZES ON FREE ISSUE

BASIS. THESE HAVE TO BE FABRICATED TO SUIT THE REQUIREMENT. PAYMENT ONLY FOR ERECTED WEIGHT AS CERTIFIED BY BHEL ENGINEER SHALL BE MADE AT THE RATE APPLICABLE FOR STRUCTURES. NO PAYMENT IS ENVISAGED FOR FABRICATION OF STRUCTURES.

4.2.5.11
ALL RELEVANT PROVISIONS AS ABOVE SHALL APPLY, MUTATIS-MUTANDIS, TO THE WORK OF EXTERNAL STRUCTURES, INTERCONNECTING STRUCTURES, ELEVATOR STRUCTURES, ESP STAIRWAYS AND GALLARIES & EQUIPMENT HANDLING SYSTEM ETC.

4.2.6 OTHER PRODUCTS AND SYSTEMS AND COMMON REQUIREMENTS

A) DUCTS / EXPANSION BELLOWS (METALLIC & NON-METALLIC) ARE NORMALLY SUPPLIED IN LOOSE COMPONENTS / SEGMENTS AND THESE ARE TO BE ASSEMBLED AND WELDED/ JOINTED AT SITE BEFORE ERECTION. THE FABRIC PORTION OF NON-METALLIC EXPANSION JOINTS (NMEJ) NAMELY BOLSTER, FABRIC BELT AND CANOPY SHALL BE INSTALLED BY CONTRACTOR UNDER SUPERVISION/GUIDENCE OF EQUIPMENT SUPPLIER/BHEL FOR THE FIRST FEW CASES. CONTRACTOR SHALL ENSURE THAT ALL SUBSEQUENT NMEJ ARE ASSEMBLED WITH DUE CARE AND PROPER PROCEDURE. IN SIMIILAR MANNER ALL JOINTS, CONNECTING DUCTS, EXPANSION PIECES AND DAMPERS SHALL BE SEAL WELDED. THESE WELDS HAVE TO BE MADE LEAK PROOF AND TESTED AS PER TECHNICAL INSTRUCTION / REQUIREMENT.

B) CERTAIN STRUCTURAL ITEMS LIKE SILENCER SUPPORTS, ROOF CLADDING STRUCTURE, PLATFORM ETC WILL BE SUPPLIED IN RUNNING LENGTHS WHICH SHALL BE CUT TO REQUIRED SUITABLE SIZES AND ADJUSTED/TRIMMED AS PART OF WORK.

C) CONTRACTOR HAS TO MAKE CANOPIES FOR MOTORS, ACTUATORS, LUB OIL UNITS, CONTROL VALVES, ETC. MATERIAL FOR THIS WILL BE SUPPLIED IN RANDOM LENGTHS / SIZES. NO SEPARATE PAYMENT FOR FABRICATION IS ENVISAGED. ONLY THE ERECTION TONNAGE RATE APPLICABLE FOR STRUCTURE WILL BE PAID FOR THIS WORK.

D) LIGHT WEIGHT CONCRETE SLABS ARE TO BE ERECTED ON BOILER ROOF STRUCTURE . FOR WATER PROOFING OF THE ROOF 50 MM THICK CONCRETE SCREED WITH REINFORCEMENT OF 6MM / 8MM ROD FOLLOWED BY 10 LAYERS OF WATER PROOFING TO BE PROVIDED.

E) ID FANS ARE PROVIDED WITH VARIABLE FREQUENCY DRIVES. CONTRACTOR HAS TO ERECT & COMMISSION THE ONLY THE MOTOR AND OTHER MECHANICAL COMPONENTS LIKE COUPLING ETC. PANELS, TRANSFORMERS, CABLING ETC ARE NOT IN THIS WORK SPECIFICATION.

F) ALL WELDED JOINTS SHOULD BE PAINTED WITH ANTICORROSIVE PAINT/PRIMER IMMEDIATELY AFTER COMPLETION OF ALL WORK. NECESSARY PAINTS AND OTHER CONSUMABLES FOR THE ABOVE WORK ARE IN THE SCOPE OF THE CONTRACTOR.

G) HANGERS AND SUSPENSIONS, SUPPORT STEELS FOR DUCTS AND OTHER EQUIPMENTS, PIPING ETC WILL BE SUPPLIED IN RUNNING/RANDOM LENGTHS/ SIZES, WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

H) TOUCH UP AND PRESERVATIVE PAINTNG OF ALL COMPONENTS ISSUED TO AND/OR ERECTED BY CONTRACTOR SHALL FORM PART OF SCOPE OF WORK. THE CONTRACTOR SHALL ARRANGE ALL PAINTS, PRIMER AND SCONSUMABLES, T&P AND FACILITIES.

4.3 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT OF BOILER & AUXILIARIES

4.3.1
BUILDING FOUNDATIONS AND OTHER NECESSARY CIVIL WORKS FOR SUPPORTING STRUCTURES, EQUIPMENTS ETC WILL BE PROVIDED BY BHEL / CUSTOMER. THE DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC, WITH REFERENCE TO BENCHMARKS OF FOUNDATIONS AND ANCHOR BOLT PITS HAVE TO BE CHECKED AND LOGGED BY THE CONTRACTOR. THE PERMANENT

BENCHMARK / REFERENCE MARKS WILL HAVE TO BE TRANSFERRED TO NEW LOCATIONS WITH SUFFICIENT CARE TO MAINTAIN THE ACCURACY AND PROTECTED / PRESERVED WITH ADEQUATE CARE (TO ENABLE RECHECKING AT LATER DATES) AS PER BHEL INSTRUCTION.

MINOR ADJUSTMENTS OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES AND BLUE-MATCHING (WHEREVER REQUIRED) FOR ALL EQUIPMENTS AS PER BHEL ENGINEER'S INSTRUCTIONS, SHOULD BE DONE BY THE CONTRACTOR AS PART OF THE WORK. DRESSING AND CHIPPING OF FOUNDATIONS TO THE EXTENT OF 25MM FOR ACHIEVING PROPER LEVELS IS WITHIN THE SCOPE OF WORK.

4.3.2
ALL TEMPORARY FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS AND WINCHES, FOUNDATIONS FOR PUMPS, TANKS ETC ARE IN THE SCOPE OF CONTRACTOR. ALL BUILDING MATERIALS LIKE CEMENT, STEEL INCLUDING RE-INFORCEMENT BARS, GRITS CEMENTS ETC FOR SUCH TEMPORARY FOUNDATIONS SHALL HAVE TO BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED RATES. ALL SUCH FOUNDATIONS SHALL BE DEMOLISHED AND NORMAL GROUND CONDITIONS RESTORED AFTER THE USAGE.

NEUTRALISATION PIT FOR EDTA CLEANING OF UNIT-1 MAY BE ALLOWED BY THE OWNER OF THE PROJECT TO USE FOR UNIT-2 ALSO. IN CASE IT IS NOT PERMITTED THEN CONTRACTOR HAS TO MAKE THE SAME. AFTER COMPLETION OF JOB PIT HAS TO BE DISMANTLED AND AREA IS TO BE LEVELLED BEFORE HANDING OVER OF AREA TO OWNER.

EFFLUENT TO BE DISPOSED OFF SAFELY FROM NEUTRALISING PIT TO A SAFE AREAS AS PER INSTRUCTION OF BHEL ENGINEER.

4.3.3
CONTRACTOR SHALL CARRY OUT SCRAPPING AND BLUE MATCHING OF EMBEDDED PLATES/ PACKERS OF ROTATING EQUIPMENTS. CHIPPING AND THE LEVELING OF CONCRETE SURFACES, FINE DRESSING UP TO THE EXTENT REQUIRED TO OBTAIN CONTACT BETWEEN PACKER AND CONCRETE, IS ALSO COVERED IN THE SCOPE OF THIS WORK. SCRAPPING, CHIPPING AND MATCHING SHALL BE DONE SO AS TO ACHIEVE PRESCRIBED PERCENTAGE OF CONTACT BETWEEN THE TWO SURFACES.

4.3.4
BHEL WILL PROVIDE FREE OF COST ONLY THE SHIMS AND PACKER PLATES (EITHER MACHINED OR PLAIN) WHICH GO AS PERMANENT PART OF THE EQUIPMENT. CERTAIN PACKER PLATES AND SHIMS OVER AND ABOVE THE QUANTITY RECEIVED AS A PART OF SUPPLIES FROM MANUFACTURING UNITS OF BHEL, WILL HAVE TO BE CUT OUT FROM STEEL PLATES / STEEL SHEETS AT SITE TO MEET SITE REQUIREMENT. CONTRACTOR SHALL CUT AND PREPARE PACKERS AND SHIMS BY GAS CUTTING / CHISELING / GRINDING AND DE-BURR THE SAME. HOWEVER, MACHINING OF THE PACKERS WHEREVER NECESSARY,SHALL BE ARRANGED BY CONTARACTOR.

4.3.5
COMPLETE GROUTIN G OF STRUCTURES EQUIPMENTS, INCLUDING ANCHOR/ FOUNDATION BOLTS, BENEATH BASE, BASE HOLLOWS ETC, AS MAY BE APPLICABLE, IS INCLUDED IN THE SCOPE OF CONTRACTOR. ARRANGING ALL LABOUR, BUILDING MATERIALS INCLUDING CEMENT, ORDINARY PORTLAND AS WELL AS QUICK SETTING – FREE FLOW - NON-SHRINK GROUT MIX (e.g. CONBEXTRA GP1/GP2), FORM WORK, SHUTTERING, AND ANY OTHER REQUIREMENTS IS IN THE CONTRACTOR'S SCOPE. CONTRACTOR SHALL OBTAIN APPROVAL OF BHEL FOR CEMENT (ORDINARY PORTLAND AS-WELL-AS QUICK SETTING – FREE FLOW- NON-SHRINK GROUT MIX) PRIOR TO USE. CLEANING OF FOUNDATION SURFACES, POCKET HOLES AND ANCHOR BOLT PITS AND DE-WATERING AND MAKING THEM FREE OF OIL, GREASE, SAND AND OTHER FOREIGN MATERIALS BY SODA WASHING, WATER WASHING, COMPRESSED AIR AND OTHER APPROVED METHODS ARE WITHIN THE SCOPE OF THIS SPECIFICATION/ WORK.

4.3.6
AFTER THE GROUTING HAS FINALLY SET AND CURED, ALIGNMENT OF EQUIPMENTS INVOLVED SHALL BE CHECKED AGAIN TO VERIFY FOR ANY DISTURBANCE OR ANY OTHER REASON. IF REQUIRED, DE-COUPLING OF EQUIPMENTS HAS TO BE DONE FOR CONDUCTING THE VERIFICATION. IN CASE ANY DISTURBANCE IS NOTICED THE CAUSE, IF ANY, SHALL BE REMOVED AND RE-ALIGNMENT DONE AS PART OF WORK.

4.4 WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT

4.4.1 WELDING
4.4.1.1
INSTALLATION OF EQUIPMENT INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE QUALIFICATION ON THE ABOVE WORKS.

4.4.1.2
THE METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHOD WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT.

4.4.1.3
WELDING OF HIGH PRESSURE JOINTS SHALL BE DONE BY IBR CERTIFIED HIGH PRESSURE WELDERS WHO HAVE BEEN PERMITTED BY CIB OF STATE CONCERNED FOR DEPLOYMENT AT THE SITE OF WORK.

4.4.1.4
WELDING OF ALL ATTACHMENTS TO PRESSURE PARTS, PIPING SHALL BE DONE ONLY BY THE QUALIFIED AND APPROVED WELDERS.

4.4.1.5
BEFORE ANY WELDER IS ENGAGED ON WORK, HE SHALL BE TESTED AND QUALIFIED BY BHEL/ CUSTOMER, THOUGH THEY MAY POSSESS THE IBR/OTHER CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON. ALL THE EXPENDITURE IN TESTING/QUALIFICATION OF THE CONTRACTOR'S WELDER SHALL BE BORNE BY CONTRACTOR.

4.4.1.6
UNSATISFACTORY AND CONTINUOUS POOR PERFORMANCE MAY RESULT IN DISCONTINUATION OF CONCERNED WELDER.

4.4.1.7
THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT RUSTING, CORROSION. FOR THIS CONSUMABLES LIKE PAINT /PRIMER ETC WILL BE IN THE CONTRACTOR'S SCOPE.

4.4.1.8
HP JOINT FIT-UP, SHOULD BE PROTECTED, WHERE REQUIRED, BY USE OF TAPES/PROTECTIVE PAINT AS MAY BE PRESCRIBED BY BHEL. THE CONTRACTOR SHALL ARRANGE CONSUMABLES LIKE PROTECTIVE PAINTS/TAPES ETC.

4.4.1.9
THE CONTRACTOR SHALL MAINTAIN WELDING RECORDS IN THE FORM AS PRESCRIBED BY BHEL CONTAINING ALL NECESSARY DETAILS, AND SUBMIT THE SAME TO THE BHEL ENGINEER AS REQUIRED. INTERPRETATION OF THE BHEL ENGINEER REGARDING ACCEPTABILITY OF THE WELDS SHALL BE FINAL.

4.4.1.10
IN THE CASE OF P-91 PIPE WELDING, CONTRACTOR SHALL DEPLOY WELDERS HAVING EXPERIENCE IN WELDING OF P-91 MATERIAL. THE WELDERS ENGAGED BY CONTRACTOR IF NOT QUALIFIED FOR P-91 WELDING WILL BE TRAINED BY BHEL AT BHEL WELDING RESEARCH INSTITUTE (WRI) TRICHY AND ALLOWED TO WORK ONLY AFTER PASSING THE REQUIRED TEST ARRANGED BY BHEL. ALL THE EXPENDITURE TOWARDS SUCH QUALIFICATION INCLUDING COST OF TRAINING, TRAVELING EXPENSES, STAY ETC., SHALL BE BORNE BY THE CONTRACTOR.

4.4.1.11
JOINT FIT UP WILL BE A STAGE OF INSPECTION. WHERE REQUIRED, JOINTS SHALL BE OFFERED FOR VISUAL INSPECTION AFTER ROOT RUN. SUBSEQUENT WELDING SHOULD BE MADE ONLY AFTER THE APPROVAL OF ROOT RUN.

4.4.1.12 SOCKET WELDING :
IN EXECUTION OF THIS WORK, CONSIDERABLE NUMBER OF SOCKET WELD JOINTS IS INVOLVED. THE EXACT QUANTITY OF SUCH SOCKET WELDS OR PROBABLE VARIATION IN THE QUANTUM CANNOT BE FURNISHED. THE TENDERER SHALL TAKE NOTICE OF THIS WHILE QUOTING AS NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED. THE SOCKET WELDING ON HP PARTS/ HP PIPING SHALL BE DONE BY THE IBR QUALIFIED WELDERS. CONTRACTOR HAS TO ADHERE TO THE PROCEDURES/SPECIFICATION AS INDICATED IN THE DRAWING FOR SOCKET WELDING.

4.4.1.13
WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENTS. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

4.4.1.14
WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS.

4.4.2 HEAT TREATMENT:

4.4.2.1
FOR THE PURPOSE OF TEMPERATURE RECORDING OF STRESS RELIEVING PROCESS, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.

4.4.2.2
CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER FOR MEASURING TEMPERATURE DURING PRE-HEATING FOR WELDING OR FOR CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLY OF SOLID STATE TYPE.

4.4.2.3
HEAT TREATMENT MAY BE REQUIRED TO BE CARRIED OUT AT ANY TIME (DAY OR NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS INCLUDING LABOURER REQUIRED FOR THE SAME AS PER DIRECTIONS OF BHEL.

4.4.2.4
IN CERTAIN CASES ONLY THE PRE-HEATING OF WELD JOINTS MAY BE CALLED FOR.

4.4.2.5
FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

4.4.2.6
CHECKING EFFECTIVENESS OF STRESS RELIEVING BY HARDNESS TESTS (BY DIGITAL HARDNESS TESTER OR OTHER APPROVED TEST METHODS AS PER BHEL ENGINEER'S INSTRUCTION) INCLUDING NECESSARY TESTING EQUIPMENTS IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION.

4.4.2.7
PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. WHERE THE ELECTRIC RESISTANCE HEATING METHOD IS ADOPTED CONTRACTOR SHALL MAKE ALL ARRANGEMENT INCLUDING HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES, ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC, REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.

BHEL WILL PROVIDE THE INDUCTION HEATING EQUIPMENT SET FOR SA 335 P-91 MATERIALS PIPING ONLY. THE SET WILL COMPRISE OF FOLLOWING:

(i) MAIN PANEL
(ii) CAPACITOR PANEL
(iii) INTERCONNECTION POWER & CONTROL CABLES BETWEEN ABOVE PANELS
(iv) 185 sq mm SPECIAL CONNECTING CABLE FROM CAPACITOR PANEL OUTPUT – 5M LENGTH.

CONTRACTOR SHALL PROVIDE THE INPUT ELECTRICAL POWER CONNECTION INCLUDING ARRANGEMENTS SUCH AS DB, CABLES ETC, THERMOCOUPLE PADS, THERMOCOUPLES AND COMPENSATING CABLES, INDUCTION HEATING ANNEALING CABLES (FROM THE CAPACITOR PANEL TO JOINT AND FOR WRAPPING AROUND THE WELD JOINT) (SPEC: SINGLE CORE 240 Sq mm, 1200A, 3KHz), CERAMIC WOOL AND OTHER CONSUMABLES ETC AS MAY BE REQUIRED. QUANTUM OF ANNEALING CABLE REQUIREMENT WILL DEPEND ON MANY PARAMETERS e.g. WELD JOINT SIZE, HEAT INPUT, TYPE OF CONNECTION i.e. SERIES OR PARALLEL ETC.
LIKELY SUPPLIER: MANSFIELD CABLE CO. NOIDA (UP).

4.4.2.8
ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND DUE CLEARANCES OBTAINED.

4.4.2.9
DURING WELDING & POST WELD HEAT TREATMENT OF MAIN STEAM PIPING (P-91 MATERIAL), THE INDUCTION HEATING PROCESS SHALL CONTINUE UN-INTERRUPTED. THEREFORE, CONTACTOR SHALL ARRANGE BACK-UP DG SET TO TAKE CARE OF POWER INTERRUPTIONS DURING THE PROCESS.

4.4.2.10
RESULTS OF THESE PROCESSES SHALL BE VERIFIED/ VALIDATED AS PER REQUIREMENTS OF BHEL/CLIENT.

4.4.3 NON DESTRUCTIVE EXAMINATION :

4.4.3.1
CONTRACTOR SHALL PROVIDE ALL RESOURCES AND MAKE ALL ARRANGEMENTS FOR THE RADIOGRAPHIC EXAMINATION OF WELDS FOR THIS WORK. FOR REASONS OF SAFETY, INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT AFTER THE NORMAL WORKING HOURS AND CLOSE OF OTHER SITE ACTIVITIES ONLY. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME.

4.4.3.2
RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE MINIMUM QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS PER PROVISION OF IBR/BHEL'S ERECTION DOCUMENTS. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER/BOILER INSPECTING AUTHORITY. BIDDER SHALL ALSO ARREAGE THE UT EQUIPMENT WITH RECORDING FACILITY AT HIS OWN COST. USAGE OF UT EQUIPMENT SHALL BE AS PER DIRECTION OF BHEL ENGINEER. RECORDS OF UT SHALL BE PRODUCED AS PER SITE REQUIREMENT.

4.4.3.4
ALL X-RAY / GAMMA RAY FILMS OF WELD JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND REQUISITE CLEARANCES SHALL BE OBTAINED BY THE CONTRACTOR.

4.4.3.5
THE FIELD WELDED JOINTS SHALL BE SUBJECT TO DYE-PENETRANT/MPT/RT/ OTHER NON-DESTRUCTIVE EXAMINATION AS SPECIFIED IN THE RESPECTIVE ENGINEERING DOCUMENTS/ AS INSTRU CTED BY BHEL.

4.4.3.6
WHERE REQUIRED, SURFACE PREPARATION, LIKE SMOOTH GRINDING OF WELDED AREA, PRIOR TO RADIOGRAPHY SHALL BE DONE. IT MAY ALSO BECOME NECESSARY TO ADOPT INTER-LAYER RADIOGRAPHY/MPT/UT DEPENDING UPON THE SITE/ TECHNICAL REQUIREMENT NECESSITATING INTERRUPTIONS IN CONTINUITY OF THE WORK AND MAKING NECESSARY ARRANGEMENTS FOR CARRYING OUT THE ABOVE WORK. THE CONTRACTOR SHALL TAKE ALL THIS INTO ACCOUNT IN HIS OFFER. THE REQUIRED NDT METHOD/PROCEDURE WILL BE DECIDED BY BHEL ENGINEER AT SITE.

4.4.3.7
TENDERER SHALL NOTE THAT 100% RADIOGRAPHY SHALL BE TAKEN ON ALL HIGH PRESSURE WELDING TILL SUCH TIME THE WELDERS' PERFORMANCE IS FOUND BY BHEL ENGINEERS TO BE SATISFACTORY. SUBSEQUENTLY, SUBJECT TO CONSISTENCY IN WELDER'S PERFORMANCE. THE PERCENTAGE OF RADIOGRAPHY WILL BE BASED ON BHEL'S STANDARD PRACTICE/CODE REQUIREMENT. THE DEFECTS SHALL BE RECTIFIED IMMEDIATELY AND TO THE SATISFACTION OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING ACCEPTANCE / REJECTING THE JOINTS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

4.4.3.8
100% RADIOGRAPH OF CERTAIN SIZES IN PIPING HAVE TO BE TAKEN AS PER BHEL STANDARDS/ DRAWINGS.

4.4.3.6
FOR CARRYING OUT ULTRASONIC TESTING OF WELDING JOINTS OF LARGE SIZE TUBES AND PIPES, IT WILL BE NECESSARY TO PREPARE SURFACE BY GRINDING AND BUFFING A SMOOTH FINISH AND CONTOUR AS NECESSARY. THE CONTRACTOR'S SCOPE OF WORK INCLUDES SUCH PREPARATION AS INCIDENTAL TO WORK.

4.4.3.8
AFTER STRESS RELIEVING 5% OF UT FOR ALL CRITICAL LINES AND 2% OF UT FOR OTHER ALLOY STEEL LINES TO BE TAKEN TO ENSURE SOUNDNESS OF JOINTS PARTICULARLY STRESS RELIEVING CRACKS. NO SEPARATE PAYMENT WILL BE MADE.

4.4.3.9
CONTRACTOR MAY HAVE TO UNDERTAKE RADIOGRAPHY WITH COBALT-60 ISOTOPE CAMERA IN CERTAIN CASES. HOWEVER, FOR ANY REASON IF USE OF COBALT-60 IS NOT POSSIBLE THEN

THESE JOINTS SHALL BE CHECKED BY RADIOGRAPHY AFTER COMPLETION OF WELDING UP TO SUITABLE PART OF THICKNESS WITH IR–192 OTHER SUITABLE SOURCE. SUBSEQUENTLY AFTER COMPLETING THE JOINT UT TO BE DONE. FOR THIS CONTRACTOR HAS TO DEPLOY LEVEL–II OPERATOR CERTIFIED BY BARC.

4.4.3.10
IN THE CASE OF P-91 PIPING WHEREVER RADIOGRAPHY IS NOT POSSIBLE, ALTERNATIVELY ULTRASONIC TEST HAS TO BE CARRIED OUT APART FROM OTHER NDE CHECKS.

4.4.3.11
FOR PIPING OF THICKNESS LESS THAN 25 MM NO RADIOGRAPHY PLUGS WILL BE PROVIDED. RADIOGRAPHY SHOTS TO BE TAKEN BY DOUBLE WALL TECHNIQUE OR ANY OTHER METHOD TO BE ADOPTED IN CONSULTATION WITH BHEL ENGINEER AT SITE.

4.4.3.12
NO SEPARATE PAYMENT FOR ANY NDE ACTIVITIES, EXCEPT FOR RADIOGRAPHY, IS ENVISAGED. FOR RADIOGRAPHY PAYMENT WILL BE MADE BASED ON THE ACCEPTED ITEM RATE ON CERTIFIED MEASUREMENT.

4.5 TESTING, PRE-COMMISSIONING, AND COMMISSIONING

4.5.1
TESTING, PRE-COMMISSIONING, & COMMISSIONING WILL INVOLVE, THOUGH NOT LIMITED TO THESE, VARIOUS TESTING e.g. HYDRO-STATIC PRESSURE, PRESSURE DECAY TESTS, LEAK TEST, TRIAL RUNS OF EQUIPMENTS; FLUSHING BY AIR, WATER, OIL, STEAM AS APPLICABLE; CHECKING/SETTING VARIOUS CLEARANCES/ PARAMETERS, ENSURING OPERATION OF VARIOUS EQUIPMENTS FREE OF UNDUE RESTRICTIONS, CHEMICAL **(EDTA)** CLEANING & ALKALI BOIL OUT OF BOILER, STEAM BLOWING OF THE BOILER AND THE CRITICAL PIPING, FLOATING OF SAFETY VALVES, COAL FIRING, TRIAL OPERATION AND LOADING ETC ARE SOME OF THESE ACTIVITIES. ALL THE ACTIVITIES FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

4.5.2
ALL THESE TESTS SHOULD BE REPEATED TILL ALL THE EQUIPMENTS SATISFY THE REQUIREMENT / OBLIGATIONS OF BHEL TO THEIR CLIENT AND ALSO THE RELEVANT STATUTORY AUTHORITY.

4.5.3
CONTRACTOR SHALL LAY / INSTALL NECESSARY TEMPORARY PIPING, PUMPS, VALVES, BLANKS, GAUGES, CABLES, SWITCHES ETC FOR CONDUCT OF HYDRAULIC / PRESSURE TEST, CHEMICAL CLEANING, STEAM / AIR BLOWING ETC. THIS MAY INVOLVE CUTTING OF SOME PORTION OF EXISTING PIPING / VALVES, PLACING OF RUBBER WEDGES / BLANKS IN THE VALVES AND OTHER OPENINGS, FABRICATION AND INSTALLATION OF TEMPORARY TANKS FOR CHEMICAL MIXING, TEMPORARY ACCESS PLATFORMS TO MIXING TANKS ETC. WHERE REQUIRED, BENDS HAVE TO BE FABRICATED / FORMED AT SITE FROM RANDOM LENGTH / SIZE OF PIPES / STRUCTURAL STEEL. TEMPORARY INSTALLATION ITSELF HAS TO BE TESTED, TRIED, AND SUBJECT TO NON-DESTRUCTIVE EXAMINATIONS AS PER THE INSTRUCTIONS OF BHEL AS PART OF WORK.

NO PAYMENT WILL BE MADE FOR TEMPORARY INSTALLATIONS MADE FOR HYDRAULIC TESTING OF VARIOUS SYSTEMS & PIPING. SIMILARLY NO PAYMENT WILL BE MADE FOR ELECTRICAL INSTALLATIONS MADE FOR ANY TEMPORARY SYSTEM.

4.5.4
ALL MATERIALS, EQUIPMENTS NECESSARY FOR INSTALLATION OF TEMPORARY SYSTEM AS ABOVE WILL BE SUPPLIED BY BHEL AS FREE RETURNABLE ISSUE IN RANDOM SIZES / LENGTHS. HOWEVER, SERVICING, FABRICATION, ERECTION, DISMANTLING OF THE SAME AFTER COMPLETION OF THE PROCESS, AND HANDING OVER BACK TO BHEL STORES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

IN ACCOUNTING OF MATERIALS FOLLOWING WASTAGE ALLOWANCES ARE PROVIDED:

1. STRUCTURAL ITEMS : 5%

2. PIPES : 3%

NO WASTAGE ALLOWANCE FOR VALVES & OTHER EQUIPTMENTS.

4.5.5
FABRICATION, FIT-UP, PRE-HEATING, WELDING, POST-WELD HEATING AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST / LEAKAGE TEST IS PART OF WORK. SIMILARLY, REMOVAL OF BLANKS, RESTORATION AND NORMALIZATION OF THE CONCERNED SYSTEM / LINE IS TO BE DONE AS PART OF WORK. BHEL WILL PROVIDE THE MATERIAL FOR BLANKS FREE OF CHARGE. NO SEPARATE PAYMENT IS ENVISAGED FOR THESE ACTIVITIES.

4.5.6
OVERHAULING, CLEANING, SERVICING OF TANKS, PUMPS, EQUIPMENTS, VALVES, DURING ERECTION AND COMMISSIONING STAGES ARE IN THE SCOPE OF WORK. GASKETS, PACKING & SPARES FOR REPLACEMENT WILL BE PROVIDED FREE OF CHARGES BY BHEL.

4.5.7
AFTER CHEMICAL CLEANING / PICKLING OF LUBRICATING SYSTEM (INCLUDING OIL PIPING, OIL TANK AND OTHER FITTINGS) OF ROTATING MACHINES, OIL FLUSHING FOR LUBRICATING SYSTEMS AS PER INSTRUCTIONS OF BHEL ENGINEER SHALL BE CARRIED OUT. CLEANING OF OIL TANK OF LUBRICATING OIL SYSTEM OF ROTATING MACHINERY BEFORE AND AFTER OIL FLUSHING IS IN THE SCOPE OF WORK.

4.5.8
TRANSPORTATION OF OIL DRUMS FROM CUSTOMER'S / BHEL'S STORES, FILLING OF OIL FOR FLUSHING, FIRST FILL OF LUBRICANTS AND SUBSEQUENT TOPPING UP DURING TRIALS, TESTS AND COMMISSIONING IS INCLUDED IN THE SCOPE OF THIS CONTRACT. THE CONTRACTOR SHALL HAVE TO RETURN ALL THE EMPTY DRUMS TO THE CUSTOMER / BHEL STORES. SIMILARLY, FOR VARIOUS PRE-COMMISSIONING / COMMISSIONING ACTIVITIES / PROCESSES MENTIONED IN VARIOUS CLAUSES, TRANSPORT OF CHEMICALS FROM BHEL / CUSTOMER'S STORES, CHARGING OF CHEMICALS INTO THE SYSTEM AND RETURNING OF REMAINING CHEMICALS AND THE EMPTY CONTAINERS OF THE CHEMICALS TO CUSTOMER / BHEL STORES IS THE RESPONSIBILITY OF THE CONTRACTOR.

4.5.9
DURING TRIAL RUNS/ TESTS, PRE-COMMISSIONING / COMMISSIONING, REPLACING / CHANGING MECHANICAL / OTHER SEALS OF EQUIPMENTS LIKE PUMPS, REMOVAL AND CLEANING / REPLACING OF FILTERS ETC IS WITHIN THE SCOPE OF WORK. REPLACEMENT SPARES FOR THIS PURPOSE WILL BE PROVIDED BY BHEL.

4.5.10
IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF ALL EQUIPMENTS AND THEIR AUXILIARIES, SUCH AS INTERFERENCES, RUBBING, LOOSE COMPONENTS, ABNORMAL NOISE OR VIBRATION, STRAIN ON CONNECTED EQUIPMENT ETC THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS AND TAKE NECESSARY CORRECTIVE MEASURES. READJUSTMENT AND/OR REALIGNMENT, IF NECESSARY, SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS. CLAIM, IF ANY, FOR THESE WORKS SHALL BE GOVERNED BY SECTION-13, SPECIAL CONDITIONS OF CONTRACT PROVIDED THE CAUSE OF SUCH WORK IS NOT ATTRIBUTABLE TO THE CONTRACTOR.

4.5.11

i) CONTRACTOR SHALL CUT / OPEN / DISMANTLE WORK, IF NEEDED, AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER.

ii) SIMILARLY, DURING THE COURSE OF ERECTION, IF CERTAIN PORTION OF EQUIPMENTS ERECTED BY THE CONTRACTOR HAS TO BE UNDONE FOR ENABLING OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER TO CARRY OUT THEIR WORK, CONTRACTOR SHALL CARRY OUT SUCH JOBS EXPEDITIOUSLY AND PROMPTLY AND MAKE GOOD THE JOB AFTER COMPLETION OF WORK BY OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER AS PER BHEL ENGINEER'S / AGENCIES OF BHEL / CUSTOMERS INSTRUCTIONS. CLAIMS, IF ANY, IN THIS REGARD SHALL BE GOVERNED AS PER CLAUSES IN SECTION-13 HEREIN.

4.5.12

DURING THIS PERIOD, THOUGH BHEL/ CLIENT'S STAFF WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO ARRANGE FOR COMPLETE REQUIREMENT OF MEN AND REQUIRED TOOLS AND PLANTS, CONSUMABLES, SCAFFOLDING AND APPROACHES ETC TILL SUCH TIME THE COMMISSIONED UNIT UNDERGOES TRIAL OPERATIONS.

4.5.13

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL OPERATION. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED WORKFORCE COMPRISING OF SUITABLE SKILLED AND SEMI-SKILLED / UN-SKILLED WORKMEN AND SUPERVISORY STAFF ALONGWITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC.

4.5.14

IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK DURING THE PRE-COMMISSIONING AND COMMISSIONING PERIOD ALONGWITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL THESE FACTORS.

4.5.15

THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON ERECTED EQUIPMENT COVERED UNDER THE SCOPE OF THIS CONTRACT DURING TESTING, PRE-COMMISSIONING AND COMMISSIONING, TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

4.5.16

AT VARIOUS STAGES OF COMPLETION BOILER HAS TO BE PRESERVED AGAINST CORROSION EITHER BY WET PRESERVATION OR BY DRY PRESERVATION AS PER THE REQUIREMENT OF BHEL ENGINEER. CONTRACTOR SHALL CARRY OUT ALL THE INCIDENTAL JOBS LIKE FILLING UP OF WATER, DOZING OF CHEMICALS AND PRESSURIZING THE SYSTEM TO THE REQUIRED PRESSURE, CHANGE OF GAS REFILLS ETC. THE BOILERS HAVE A PERMANENT N_2 BLANKETING ARRANGEMENT.

DURING THIS PERIOD, THOUGH BHEL/ CLIENT'S STAFF WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO ARRANGE FOR COMPLETE REQUIREMENT OF MEN AND REQUIRED TOOLS AND PLANTS, CONSUMABLES, SCAFFOLDING AND APPROACHES ETC., TILL SUCH TIME THE COMMISSIONED UNIT IS TAKEN OVER.

4.5.17

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL RUN, TRIAL OPERATION. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED LABOR FORCE COMPRISING OF SUITABLE SKILLED AND SEMI/UN-SKILLED HANDS ALONG WITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC.

4.5.18
IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK DURING THE PRE-COMMISSIONING AND COMMISSIONING PERIOD ALONG WITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL THESE FACTORS.

4.5.19
CONDUCT OF PERFORMANCE GUARANTEE TEST IS IN THE SCOPE OF WORK. CONTRACTOR SHALL INSTALL ALL NECESSARY TAPPING POINTS, INSTRUMENTS ETC AND PROVIDE NECESSARY ASSISTANCE IN THIS REGARD**.**

IN CASE PG TEST IS GETTING DELAYED BEYONG THE CONTRACT PERIOD (NORMAL PLUS GRACE PLUS EXTENSION IF ANY) DUE TO REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR, PG TEST ISSUE WILL BE MUTUALLY DISCUSSED AND DECIDED. HOWEVER INTALLATION OF NECESSARY TAPPING POINTS, IMPULSE PIPES, APPROACHES ETC ARE TO BE COMPLETED BY THE CONTRACTOR.

4.5.20
THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON ERECTED EQUIPMENT COVERED UNDER THE SCOPE OF THIS CONTRACT DURING TESTING, PRE-COMMISSIONING AND COMMISSIONING, TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

4.6 GENERAL RESPONSIBILITY OF THE CONTRACTOR

4.6.1
THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINE SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

4.6.2 PRESERVATION & PROTECTION OF COMPONENTS

AT ALL STAGES OF WORK, EQUIPMENTS/MATERIALS IN THE CUSTODY OF CONTRACTOR, INCLUDING THOSE ERECTED, WILL HAVE TO BE PRESERVED AS PER THE INSTRUCTIONS OF BHEL. NECESSARY PRESERVATION AGENTS INCLUDING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY THE CONTRACTOR.

4.6.3
THE CONTRACTOR SHALL MAKE SUITABLE SECURITY ARRANGEMENTS INCLUDING EMPLOYMENT OF SECURITY PERSONNEL AND ENSURE PROTECTION OF ALL MATERIALS/ EQUIPMENT IN THEIR CUSTODY AND INSTALLED EQUIPMENTS FROM THEFT/FIRE/PILFERAGE AND ANY OTHER DAMAGES AND LOSSES.

4.6.4
CONTRACTOR SHALL COLLECT ALL SCRAP MATERIALS PERIODICALLY FROM VARIOUS AREA OF WORK SITE, DEPOSIT THE SAME AT ONE PLACE EARMARKED AT SITE OR SHIFT THE SAME TO A PLACE EARMARKED IN BHEL/ CLIENT'S STORES. IN CASE OF FAILURE OF CONTRACTOR IN COMPLIANCE OF THIS REQUIREMENT, BHEL WILL MAKE SUITABLE ARRANGEMENT AT CONTRACTOR'S RISK AND CO ST.

4.6.5
THE ENTIRE SURPLUS, DAMAGED, UNUSED MATERIALS, PACKAGING MATERIALS / CONTAINERS, SPECIAL TRANSPORTING FRAMES, GUNNY BAGS, ETC SHALL BE RETURNED TO BHEL STORES BY THE CONTRACTOR.

4.6.6
THE CONTRACTOR SHALL NOT WASTE ANY MATERIALS ISSUED TO HIM. IN CASE IT IS OBSERVED AT ANY STAGE THAT THE WASTAGE/EXCESS UTILISATION OF MATERIALS IS NOT WITHIN THE PERMISSIBLE LIMITS, RECOVERY FOR THE EXCESS QUANTITY USED OR WASTED WILL BE EFFECTED WITH DEPARTMENTAL CHARGES FROM THE CONTRACTOR. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

4.6.7
FOR ANY CLASS OF WORK FOR WHICH NO SPECIFICATIONS HAVE BEEN LAID DOWN IN THESE SPECIFICATIONS, WORK SHALL BE EXECUTED AS PER THE INSTRUCTIONS OF BHEL.

4.7 FABRICATION OF STRUCTURE AND EMBEDMENTS

4.7.1
FABRICATION OF STRUCTURES FOR PIPE RACK INTERCONNECTING MAIN PLANT AND CPU REGENERATION BUILDING, ACCESS PLATFORMS FOR OIL ROOM, C.F. ROOM, VALVE ROOM, LP BYPASS AND DRAIN VALVES ETC IS IN THE SCOPE OF WORK. SIMILARLY FABRICATION OF EMBEDMENTS OF TG DECK IS ALSO IN THE SCOPE OF WORK.

4.7.2
THE FABRICATION DRAWINGS FOR THESE WILL BE PROVIDED BY BHEL. CONTRACTOR SHALL FABRICATE THE ITEMS AS PER THE DIMENSIONS AND TOLERANCES INDICATED THEREIN. WHERE SUCH INFORMATION IS NOT AVAILABLE, RELEVANT INDIAN STANDARD MAY BE USED WITH THE APPROVAL OF BHEL ENGINEER.

4.7.3
THE RAW MATERIALS FOR THE ABOVE PURPOSE IN RUNNING METER AND RANDOM SIZES WILL BE PROVIDED BY BHEL. CONTRACTOR SHALL DRAW THE MATERIAL AND SUBMIT ITEMWISE DUE ACCOUNT OF THE STOCK USED IN FINISHED ITEMS. SCRAPS, BOTH SERVICEABLE AND UN-SERVICEABLE, SHALL BE RETURNED TO BHEL STORAGE YARD AND ACCOUNTED FOR. FOR LONG ITEMS SUCH AS ROLLED SECTIONS AND PIPES THE UN-SERVICEABLE WOULD MEAN LESS THAN 1M IN LENGTH, AND FOR PLATES ETC THE UN-SERVICEABLE SHOULD MEAN LESS THAN 500X500 MM IN SIZE. WASTAGE ALLOWANCE IN FABRICATION OF 2% ON FINISHED STOCK ON ALL TYPES OF STEEL ITEMS WILL BE ALLOWED. ANY EXCESS CONSUMPTION/ UN-ACCOUNTED STOCK/ EXCESSIVE WASTAGE SHALL BE CHARGED TO THE CONTRACTOR'S ACCOUNT AT THE APPLICABLE PREVAILING RATES FOR SUCH ITEM.

4.7.4
ALL THESE ITEMS HAVE TO BE PAINTED WITH 1 COAT OF RED OXIDE PRIMER, OF BHEL APPROVED MAKE AND SPECIFICATION, PRIOR TO RELEASE FOR ERECTION.

4.7.5
IN ADDITION TO ABOVE, BHEL WILL SUPPLY FABRICATED GRATINGS, WHICH HAVE TO BE ERECTED AND FASTENED AS PER INSTRUCTIONS OF BHEL.
4.7.6
CONTRACTOR SHALL QUOTE RATE ONLY FOR FABRICATION. THE PAYMENT FOR ERECTION, ALIGNMENT, WELDING ETC WILL BE BASED ON THE ACCEPTED RATE AND ON TERMS OF PAYMENT APPLICABLE FOR STRUCTURES.

4.7.7
THE EMBEDMENTS FOR TG AFTER FABRICAION SHALL BE HANDED OVER TO BHEL/CLIENT/OTHER AGENCY AS PER THE INSTRUCTION OF BHEL DULY ACCOUNTING FOR THE SAME.

4.8
BHEL IS OPERATING WEB BASED COMPUTERIZED SITE OPERATION MANAGEMENT SYSTEM (SOMS) THAT INCLUDES, INTER-ALIA, ISSUE OF MATERIALS, DAILY PROGRESS REPORTING, CONTRACTOR'S RUNNING MONTHLY BILLING AND MATERIAL RECONCILIATION THROUGH A

COMPUTERIZED DATA MANAGEMENT SYSTEM. CONTRACTOR SHALL INSTALL NECESSARY HARDWARE TO HOOK-UP WITH THE BHEL'S SYSTEM AND USE THE SAME FOR HIS SCOPE OF WORK.

IN THE EVENT THE COMPUTERIZED SOMS IS INOPERATIVE FOR ANY REASONS, THE CONTRACTOR SHALL TAKE DELIVERY OF MATERIALS FROM THE STORAGE AREA/SHEDS OF BHEL/CUSTOMER AFTER GETTING THE APPROVAL OF THE ENGINEER/CUSTOMER ON STANDA RD INDENT FORMS TO BE SPECIFIED BY BHEL/CUSTOMER. ALL THESE RECORDS HOWEVER SHALL BE UPDATED IN THE SOMS AS AND WHEN THE SOMS IS REACTIVATED/NORMALIZED.

4.9 MATERIALS HANDLING AND MATERIALS MANAGEMENT

THE SCOPE OF WORK OF MATERIAL HANDLING AND MATERIALS MANAGEMENT SHALL BROADLY BE AS UNDER:

1) UNLOADING OF HEAVIER CONSIGNMENTS/ODC (e.g., BOILER DRUM, TRANSFORMERS ETC.) DIRECTLY FROM TRAILORS BY SUITABLE CRANE (OR BY JACK AND SLEEPER METHOD), INCLUDING LEVELLING OF THE UNLOADING AREA AND ATTENDANT WORK.

2) RECEIPT OF MATERIALS DISPATCHED BY ROAD TRANSPORT ON DOOR DELIVERY BASIS AT THE BHEL/MSEB STORES AND UNLOADING THEREOF.

3) COLLECTION OF MATERIALS DISPATCHED BY ROAD TRANSPORT ON GODOWN DELIVERY BASIS FROM TRANSPORTERS' GODOWNS, LOADING AT TRANSPORTERS GODOWN, LOCAL TRANSPORT UP TO BHEL/MSEB STORES AND UNLOADING THEREOF.

4) PRELIMINARY VERIFICATION OF MATERIALS AT THE TIME OF UNLOADING FROM ROAD TRANSPORT VEHICLE OR WHILE RECEIVING CONSIGNMENTS FROM TRASPORTERS GODOWN - AS THE CASE MAY BE, REPORTING DISCREPANCIES LIKE DAMAGES AND SHORTAGES NOTICED IMMEDIATELY.

5) DETAILED VERIFICATION OF MATERIALS WITH REFERENCE TO PACKING LIST AND LOADING ADVICE SLIP AFTER UNPACKING OF BOXES & CRATES; REPACKING AFTER DETAILED VERIFICATION; PREPARATION OF RECEIPT INSPECTION REPORTS.

6) STACKING AND STORING AT BHEL/MSEB OPEN STORAGE YARD/ COVERED STORES/ CLOSED & SEMI-CLOSED SHEDS, SUBMISSION OF STACKING/STORING RECORDS.

7) PRESERVATION OF THE MATERIALS IN ACCORDANCE WITH BHEL'S PRESERVATION MANUAL AND/OR AS PER BHEL'S INSTRUCTIONS.

8) GENERA L CLEANING, GRASS CUTTING AND UPKEEP OF STORAGE YARD, COVERED AND SEMI-CLOSED STORES SHEDS WITHIN THE QUOTED RATES FOR UNLOADING, VERIFICATION AND STACKING.

9) PROVIDING SERVICES FOR MATERIALS MANAGEMENT (OPERATION OF COMPUTERIZED MATERIALS MANAGEMENT SYSTEM – FEEDING DATA, UPDATION, GENERATION OF VAROUS REPORTS ETC.).

10) REHANDLING AND RESTACKING OF MATERIALS AS AND WHEN CALLED FOR BY BHEL. THIS ALSO INCLUDES EXCESS/REDUNDANT MATERIALS RETURNED TO STORES BY BHEL'S ERECTION CONTRACTORS.

11) HANDLING AND LOADING OF OUTGOING MATERIALS THAT ARE TO BE SENT TO OTHER DESTINATIONS.

12) PRIOR TO AWARD OF THIS WORK, CERTAIN MATERIALS WOULD HAVE BEEN UNLOADED BY OTHER AGENCY. CONTRACTOR MAY HAVE TO CARRY OUT THE RE-STACKING/SHIFTING/RE-ARRAGNING, HANDLING INCLUDING LOADING & UNLOADING FOR TRANSPORTATION TO OTHER LOCATION, VERIFICATION, PRESERVATION, IDENTIFICATION, TAGGING, GENERATING SHORTAGE/DAMAGE REPORT ETC. UNEDR THE SCOPE OF TENDER SPECIFICATION. CONTRACTOR WILL BE PAID FOR ALL ABOVE INCLUSIVE WORKS AS PER AGREED QUATED RE-STACKING RATE OF RATE SCHEDULE.

SCOPE OF WORK IS FURTHER DETAILED IN VARIOUS CLAUSES HEREAFTER.

4.9.1 MAJOR PACKAGES TO BE HANDLED ARE AS UNDER:

1. BOILER, FANS, MILLS, FEEDERS, DUCTS & DAMPERS, ESP ALONG WITH THEIR AUXILIARIES, AND PIPING.
2. STEAM TURBINE, TURBO-GENERATOR, CONDENSER, PUMPS WITH DRIVE MOTORS AND THEIR AUXILIARIES INCLUDING HEATERS, HEAT EXCHANGERS AND DE-AERATOR. **(UNLOADING OF GENERATOR STATOR EXCLUDED FROM THE SCOPE)**
3. BOILER CONTROLS & INSTRUMENTATION AND ACCESSORIES
4. TG CONTROLS AND INSTRUMENTATION AND ACCESSORIES
5. GENERATOR TRANSFORMER PACKAGE
6. STATION C&I PACKAGE WITH CABLES.
7. STATION TRANSFORMER, UNIT AUXILIARY TRANSFORMER AND OTHER TRANSFORMER PACKAGES WITH AUXILIARIES.
8. GENERATOR PROTECTION RELAY PANELS AND AUXILIARIES
9. CW & ACW PUMPS AND THEIR AUXILIARIES AND ACCESSORIES
10. GENERATOR BUS DUCT AND AUXILIARIES PACKAGE
11. POWER CYCLE AND TG CYCLE PIPING, TANKS, VESSELS ETC.
12. THERMAL INSULATION PACKAGE
13. 6.6 KV SWITCHGEAR & BUS DUCT PACKAGE
14. OTHER BHEL SUPPLIED (MANUFACTURED/BOUGHT OUT ITEMS) PACKAGES

15. CONSTRUCTION EQUIPMENTS OF BHEL INCLUDING HIGH CAPACITY CRANES SENT IN DISMANTLED CONDITION AND OTHER ITEMS RECEIVED FROM OTHER SITES/LOCATIONS.

SOME OF THE MAJOR HEAVY CONSIGNMENTS ARE:

SL.NO.	DESCRIPTION	APPROX WT
01	BOILER DRUM	140 MT
02	CEILING GIRDER –HEAVIEST PIECE	48 MT
03	WATERWALL INLET HEADER – HEAVIEST PC	30 MT
04	GENERATOR ROTOR PACKAGE	43 MT
05	GENERATOR TRANSFORMER	180 MT
06	TURBINE MODULES	60 MT
07	STATION TRANSFORMER	60 MT
08	CABINS/CRAWLERS OF 75T /100T/150T CAP CRAWLER CRANES OF BHEL	UPTO 50MT EACH

4.9.2
THE INTENT OF SPECIFICATION IS TO PROVIDE MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIALS NECESSARY FOR PROPER AND EFFICIENT UNLOADING, TRANSPORTATION, VERIFICATION, STACKING & PRESERVATION ETC SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

4.9.3
THE WORK SHALL BE EXECUTED UNDER USUAL CONDITIONS AFFECTING MAJOR THERMAL POWER PROJECTS IN AN EXISTING POWER PLANT AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF CUSTOMER'S CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK AS A WHOLE.

4.9.4
ALL THE WORK SHALL BE CARRIED OUT AS PER THE INSTRUCTIONS OF BHEL ENGINEER. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

4.9.5
THE CONTRACTOR SHALL PERFORM ALL REQUIRED SERVICES WHICH MAY NOT BE SPECIFIED HEREIN BUT NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN QUOTED RATES.

4.9.6
ALL NECESSARY CERTIFICATES AND LICENSES REQUIRED TO CARRY OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY.

4.9.7
ALL CRANES, TRANSPORT EQUIPMENTS, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES (EXCLUDING THOSE INDICATED AS BHEL SCOPE), ETC REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR.

4.9.8
ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES ELSEWHERE HERE. THE CONTRACTOR'S QUOTED RATES SHALL INCLUDE OF ALL SUCH CONTINGENCIES. IN THIS CONNECTION REFER RELEVANT CLAUSE OF GENERAL CONDITIONS OF CONTRACT.

4.9.9 RESPONSIBILITIES OF CONTRACTOR AND SCOPE OF WORK RECEIPT, UNLOADING, VERIFICATION AND STACKING **(REFER 'SECTION-"A" OF RATE SCHEDULE).**

4.9.9.1
IT WILL BE RESPONSIBILITY OF THE CONTRACTOR TO KEEP IN TOUCH WITH OFFICIALS OF BHEL REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT LORRY WAY BILLS, RAILWAY RECEIPTS OR OTHER SUCH DESPATCH DOCUMENTS.

4.9.9.2
THE CONTRACTOR SHALL REMAIN IN REGULAR CONTACT WITH THE CONCERNED TRANSPORTERS OR RAILWAYS BASED ON THE DESPATCH DETAILS OBTAINED AS STATED ABOVE AND MAKE ALL NECESSARY ARRANGEMENTS FOR COLLECTION / RECEIPT OF THE CONSIGNMENT AS APPLICABLE. CONTRACTOR SHALL TAKE ADVANCE ACTION TO DEPLOY ALL NECESSARY RESOURCES FOR LOCAL TRANSPORTATION, HANDLING AND UNLOADING OF THE ANTICIPATED CONSIGNMENTS SO AS TO ENSURE NO LOSS OF TIME UPON ARRIVAL OF THE CONSIGNMENTS.

4.9.9.3
PAYMENT OF DEMURRAGE/WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE THE RESPONSIBILITY OF CONTRACTOR AND TO HIS ACCOUNT. IF BHEL HAS TO MAKE PAYMENT OF SUCH DEMURRAGE/WHARFAGE TOGETHER WITH FREIGHT (PAYMENT OF FREIGHT ALONE IS IN BHEL'S SCOPE), THE AMOUNTS SO PAID AS DEMURRAGE/WHARFAGE FOR THE REASONS STATED ABOVE SHALL BE PAID TO BHEL BY THE CONTRACTOR FORTHWITH OR SHALL BE RECOVERED FROM THE BILL PAYMENTS DUE TO THE CONTRACTOR.

4.9.9.4
IT WOULD BE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE PACKAGES, CONSIGNMENTS ETC. IMMEDIATELY ON ARRIVAL AND BRING TO THE NOTICE OF BHEL AUTHORITIES REGARDING LOSS/DAMAGE/SHORTAGE/DISCREPANCY, IF ANY, OBSERVED IN THE CONSIGNMENTS BEFORE TAKING DELIVERY OF THE SAME.

4.9.9.5
IN CASE OF CONSIGNMENTS IN SMALLS, THE WEIGHT OF PACKAGE SHALL BE CHECKED WITH THE INVOICED WEIGHT OF THE PACKAGES AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO BHEL/TRANSPORTER.

4.9.9.6
FOR ALL SUCH CONSIGNMENTS, OBSERVATIONS REGARDING LOSS/DAMAGE/SHORTAGE/ DISCREPANCY IS TO BE RECORDED IN APPROPRIATE DOCUMENT AND INFORMED TO BHEL. IN CASE IT BECOMES NECESSARY TO TAKE '**OPEN DELIVERY'** FROM THE AUTHORITIES, CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR TAKING OPEN DELIVERIES. ALL EXPENSES CONNECTED THEREWITH SHALL BE TO THE ACCOUNT OF CONTRACTOR. ANY LOSS THAT ACCRUES TO BHEL ON ACCOUNT OF SUCH FAILURES SHALL BE DEBITED TO THE CONTRACTOR AND RECOVERY EFFECTED FROM HIS RUNNING BILLS.

4.9.9.7
ANY DISCREPANCY/SHORTAGE/DAMAGE FOUND IN THE CONSIGNMENT AFTER TAKING CLEAN DELIVERY FROM THE CARRIERS SHALL BE THE RESPONSIBILITY OF CONTRACTOR AND THE RESULTANT LOSS TO BHEL ON SUCH ACCOUNT SHALL BE RECOVERABLE FROM THE CONTRACTOR.

4.9.9.8
CONSIGNMENTS ARE EXPECTED TO ARRIVE DURING ANY TIME OF THE DAY, AND COUNT DOWN FOR DEMMURAGE/WHARFAGE WILL START IMMEDIATELY, UNLOADING OF SUCH CONSIGNMENTS MAY BE NECESSITATED EVEN IN THE NIGHT OR ROUND THE CLOCK. CONTRACTOR SHALL ARRANGE TO DEPLOY HIS RESOURCES IMMEDIATELY AND CONTINUE ROUND THE CLOCK ON SUCH OCCASSIONS WITHUT ANY ADDITIONAL COST TO BHEL. CONTRACTOR SHALL ARRANGE NECESSARY SPOT LIGHTING FOR WORKING AT NIGHT. THE CONTRACTOR SHALL SIMILARLY UNLOAD CONSIGNMENTS ARRIVING ON WEEKLY OFF DAYS AND HOLIDAYS.

4.9.9.9
UNLOADING AT STORAGE AREA/WORK SITE, STACKING AND RESTACKING IF NECESSITY ARISES, OF HEAVY/SOPHISTICATED EQUIPMENTS LIKE TUBED WALL PANELS OF BOILER, HEAVY MOTORS, COAL MILL COMPONENTS, HEAVY BEARING PEDESTALS, FAN IMPELLER AND SERVOMOTORS, ELECTRICAL PANELS AND TG EQUIPMENT LIKE HEAVY TURBINE COMPONENTS, PUMPS, PANELS, ETC. SHALL BE DONE AS PER STORAGE AND PRESERVATION MANUAL OF BHEL AND/OR AS PER DIRECTIONS OF BHEL ENGINEER.

4.9.9.10
ALL THE CONSIGNMENTS REACHING THE PROJECT SITE BY RAIL SHALL BE UNLOADED AT THE RAILWAY SIDING, FOLLOWED BY LOADING ON TRUCK/TRAILER, LOCAL TRANSPORTATION FROM RAILWAY SIDING TO THE STORAGE YARD/STORES, UNLOADING AND STACKING

4.9.9.11
THE CONTRACTOR SHALL VERIFY THE CONSIGNMENS IN DETAIL WITHIN THE TIME FRAME PRESCRIBED BY BHEL. CONTRACTOR SHALL ARRANGE ALL FACILITIES TO OPEN PACKAGES - WHERE REQUIRED IN THE PRESENCE OF BHEL ENGINEER, VERIFY THE CONTENTS, REPACK WHEREVER AND WHENEVER CALLED FOR AND PROPERLY STACK THEM AS PER STORAGE MANUAL OR/AND AS MAY BE DIRECTED BY BHEL.

4.9.9.12
THE MATERIAL SHALL BE SO STACKED THAT IT SHOULD FACILITATE EASY IDENTIFICATION, RETRIEVAL AND HANDLING FOR ISSUE AS AND WHEN NEED ARISES.

4.9.9.13
PRE-DEFINED IDENTIFICATION SYSTEM OF THE LOCATIONS OF OPEN STORAGE YARD, SEMI-CLOSED SHED, COVERED STORES AS WELL AS STORAGE RACKS HAS TO BE DESIGNED BY THE CONTRACTOR WITH THE APPROVAL OF BHEL. CONTRACTOR SHALL PUT UP PROMINENT IDENTIFICATION BOARDS OF SEGMENTAL LOCATIONS (FOR OPEN AND SEMI-CLOSED STORES) OR INSCRIPTION (ON THE STORAGE RACKS) WITH CLEAR VISIBILITY FROM A DISTANCE. CONTRACTOR SHALL ALSO ARRANGE TO DISPLAY PLOT PLAN AT REGULAR INTERVALS IN THE COVERED/SEMI-CLOSED/OPEN STORAGE. THE CONTRACTOR SHALL ARRANGE PROPER DISPLAYS/SIGNS FOR VARIOUS REQUIREMENTS AS PER INSTRUCTIONS OF BHEL.

4.9.9.14
THE CONTRACTOR SHALL EXECUTE THE WORK IN A PROFESSIONAL MANNER. THE STORES SHALL BE HANDLED WITH DUE CARE AND DILIGENCE. THE CONTRACTOR AT HIS RISK AND COST SHALL MAKE GOOD ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE.

4.9.9.15
IF THE CONTRACTOR OR HIS WORKMEN OR EMPLOYEES BREAK, DEFACE, INJURE OR DESTROY ANY PART OF A BUILDING, ROAD, KERBS, FENCE, ENCLOSURES, WATER PIPES, CABLES, DRAINS, ELECTRIC OR TELEPHONE POSTS OR WIRES, TREES OR ANY OTHER PROPERTY OR TO ANY PART OF ERECTED EQUIPMENTS, STORED COMPONENTS ETC. WITHIN THE PROJECT PREMISES OR OUTSIDE THE CONTRACTOR SHALL MAKE THE SAME GOOD AT HIS OWN EXPENSES.

4.9.9.16
LOADING ON TO THE TRANSPORTER'S TRAILER/TRUCK FOR ONWARD TRANSMITTAL TO OTHER DESTINATIONS IS ALSO SCOPE OF WORK OF CONTRACTOR. PAYMENT FOR THESE SHALL BE MADE AS PER RELEVANT ITEMS OF RATE SCHEDULE.

4.9.9.17
CONTRACTOR SHALL ARRANGE FOR CUTTING AND REMOVAL OF VEGETATION GROWTH/GRASS ETC. IN THE STORAGE YARD AS AND WHEN CALLED FOR BY BHEL AS INCIDENTAL TO WORK. BHEL WILL TAKE APPROPRIATE ACTION AT THE RISK & COST OF THE CONTRACTOR IN CASE OF FAILURE IN THIS REGARD.

4.10 SCOPE OF WORK FOR PROVIDING MATERIALS MANAGEMENT SERVICES

4.10.1
THE PERSONNEL DEPLOYED FOR MATERIALS MANAGEMENT SERVICES SHALL BE EXCLUSIVELY AVAILABLE TO BHEL. THEY SHOULD POSSESS QUALIFICATION AND EXPERIENCE AS PER BHEL'S REQUIREMENT.

4.10.2
BHEL IS OPERATING COMPUTERIZED SITE OPERATIONS MANAGEMENT SYSTEM (SOMS) THAT INCLUDES MATERIALS MANAGEMENT, PROGRESS REPORTING, SUB-CONTRACTOR BILLING AND MATERIAL RECONCILIATION THROUGH A FULLY COMPUTERIZED DATA BASE MANAGEMENT SYSTEM. CONTRACTOR SHALL ENGAGE PERSONNEL WITH PROFICIENCY IN OPERATION OF COMPUTERIZED DATA BASE MANAGEMENT SYSTEM FOR THE PURPOSE OF REGULAR OPERATION AND UPDATION OF "SOMS". THE PERSONS SHALL ALSO BE FLUENT IN BASIC COMPUTER OPERATIONS LIKE 'MS OFFICE' ETC.

4.10.3
SCOPE OF SERVICES SHALL INCLUDE MAINTENANCE OF STORES RECORDS, SUPERVISION OF ISSUE AND RETURN OF MATERIALS IN RESPECT OF BHEL'S ERECTION AGENCIES.

4.10.4
CONTRACTOR SHALL GENERATE PERIODIC STATUS REPORTS AS REQUIRED BY BHEL (REPORTS REGARDING MATERIAL DESPATCHES, RECEIPTS, SHORTAGE, DAMAGE, LOSS, ISSUE, RETURN, PENDING AND CRITICAL MATERIALS ETC.

4.10.5 PRESERVATION OF COMPONENTS DURING STORAGE IN BHEL STORES/STORAGE

CONTRACTOR SHALL ARRANGE FOR PRESERVATION OF COMPONENTS AS PER BHEL'S STORAGE AND PRESERVATION MANUAL AND/OR AS PER INSTRUCTIONS OF BHEL ENGINEER.

ONE OR MORE OF FOLLOWING METHODS SHALL BE ADOPTED FOR PRESERVATION:

1) COATING WITH PRESERVATIVE PAINTS/LUBRICANT/INHIBITORS.

2) CAPING/WRAPPING/COVERING.

3) FILLING/IMMERSION IN OIL/CHEMICALS ETC.

4) PERIODIC CHECKS/MAINTAINING REQUIRED NITROGEN PRESSURE IN TANKS OF ALL TRANSFORMERS. BHEL WILL PROVIDE THE NITROGEN GAS FOR THE SAME. HOWEVER CONTRACTOR SHALL HANDLE THE CYLINDERS, FIT-UP REFILLS AND RETURN EMPTY CYLINDERS TO BHEL STORES.

5) HT MOTORS

FOR PRESERVATION OF HT MOTORS, SPACE HEATERS HAVE TO BE KEPT ENERGIZED TO AVOID INGRESS OF MOISTURE. INSULATION RESISTANCE HAS TO BE MEASURED AND RECORDED AT SPECIFIED INTERVALS TILL THESE ARE ISSUED FOR ERECTION. BHEL WILL PROVIDE NECESSARY CABLES, SWITCHES ETC. FOR THIS HOWEVER CONTRACTOR SHALL INSTALL AND MAINTAIN THE SAME.

BHEL WILL PROVIDE, ONLY FOR PRESERVATION DURING STORAGE IN BHEL CUSTODY, FREE OF COST ALL PRESERVATIVES LIKE PRESERVATIVE OIL, LUBRICANTS, CHEMICALS, INHIBITORS, CAPS ETC EXCEPT PRIMERS & PAINTS. CONTRACTOR SHALL PROVIDE RED OXIDE ZINC CHROMATE (ROZC) PRIMER CONFORMING TO IS:2074 OF REPUTED MANUFACTURERS (E.G. ASIAN PAINTS, BERGER, JENSON & NICHOLSON, BOMBAY PAINTS, SHALIMAR, ETC.) REQUIRED FOR PRESERVATION SHALL BE USED FOR THIS PURPOSE.

ALL OTHER RESOURCES INCLUDING CONSUMABLES (EXCLUDING THOSE IN BHEL'S SCOPE), TOOLS AND PLANTS AND MANPOWER HAVE TO BE PROVIDED BY THE CONTRACTOR. CONTRACTOR'S

CRANES HAVE TO BE USED FOR HANDLING OF MATERIALS WHEREVER REQUIRED IN PRESERVATION OF MATERIALS. FOR PRESERVATION ACTIVITIES NOT INVOLVING USE OF CRANE, ONLY THE ACCEPTED MANDAY RATE WILL BE APPLICABLE FOR PAYMENT. WHERE USE OF CRANE IS NECESSITATED FOR HANDLING OF MATERIALS FOR PRESERVATION, PAYMENT WILL BE MADE FOR REHANDLING/RE-STACKING OF MATERIALS FOR WEIGHT HANDLED AS PER CORRESPONDING RATE IN ADDITION TO MANDAY RATE FOR PRESERVATION.

IN THIS PROCESS THE IDENTIFICATION MARKS, COMPONENT/MATERIAL CODES, MATCH MARKS, MAY HAVE TO BE REPAINTED. THE CONTRACTOR SHALL PROVIDE HIS OWN SUPERVISORS FOR THIS WORK. AFTER PRESERVATION, COMPONENTS ARE TO BE STACKED PROPERLY. PERIODICAL REPORTS ON THE PRESERVATION CARRIED OUT SHOULD BE SUBMITTED TO BHEL IN THE PRESCRIBED FORMATS.

4.10.6 SHIFTING/ RE-STACKING/ RE-ARRANGING DURING STORAGE/ PRESERVATION IN BHEL CUSTODY

OVER A PERIOD OF TIME, RESTACKING/REARRANGING OF THE MATERIALS STACKED EARLIER MAY ARISE DUE TO VARIOUS REASONS. THE HANDLING OF SUCH ITEMS WILL ALSO BE IN THE SCOPE OF THIS CONTRACT. THE RESTACKING/RE-HANDLING MAY BE NECESSITATED FOR ANY EQUIPMENT/ MATERIALS COVERED WITHIN THIS WORK SPECIFICATION. CONTRACTOR SHALL DEPLOY NECESSARY RESOURCES LIKE MANPOWER, T&P, EQUIPMENTS ETC. TO CARRY OUT THIS EXERCISE INCLUDING PROPER INSCRIPTION OF IDENTIFICATION MARKS IF NEEDED, PREPARATION AND SUBMISSION OF LIST OF ITEMS RESTACKED, UPDATING STOCK RECORDS ABOUT CHANGE IN LOCATION ETC.

RESTACKING AND REARRANGING SHALL BE APPLICABLE FOR MATERIALS RETURNED BY BHEL'S ERECTION CONTRACTORS ALSO.

SEPARATE ITEM RATE SHALL BE QUOTED FOR RESTACKING/RE-ARRANGING/ SHIFTING OF STAKED MATERIALS AS ASKED IN THE RATE SCHEDULE. (THIS RATE SHALL BE APPLICABLE ONLY FOR THE WORK DONE ON ITEMS DURING STORAGE IN BHEL CUSTODY).

4.10.7 RECORD KEEPING AND REPORT GENERATION

ALL THE ABOVE FUNCTIONS OF MATERIAL DESPATCHES, RECEIPT, STACKING, PRESERVATION, ISSUING ETC WILL HAVE TO BE PROPERLY RECORDED IN THE PRESCRIBED FORMATS, REGISTERS ETC. MANUALLY AND ON COMPUTER AND MADE AVAILABLE FOR VERIFICATION BY BHEL. THE REPORT GENERATION WILL BE EXHAUSTIVE AND WILL COVER DETAILS LIKE STOCK AT SITE, PENDING MATERIALS TO BE RECEIVED, MATERIALS IN TRANSIT, COMPONENTS ISSUED TO THE CONTRACTOR, LOCATION PLANS OF ITEMS STACKED AND OTHER MATERIAL STATUS DOCUMENTS.

ALL PERSONNEL DEPLOYED FOR MATERIALS MANAGEMENT SHOULD NECESSARILY BE PROFICIENT IN COMPUTER OPERATION. THEY SHOULD BE CAPABLE OF DATA ENTRY IN COMPUTERS, REPORT GENERATION AS PRESCRIBED AND INFORMATION MANAGEMENT. PRINT-OUT OF REQUIRED INFORMATION IN THE PRESCRIBED MANNER SHALL BE TAKEN BY THESE PERSONNEL.

4.10.8 PERSONNEL FOR MM SERVICES

BIDDERS ARE TO NOTE THAT THE SUPERVISORY/STORE ASSISTANCE FOR MATERIAL MANAGEMENT WORK REFERED VIDE ITEM SL. NO. B.3 OF PART II(PRICE BID) , BHEL WIL PAY A CONSOLIDATED AMOUNT OF RS 4500/- PER MONTH PER HEAD FOR SUCH SERVICES. HOWEVER, IN CASE CONTRACTOR FAILS TO PROVIDE SATISFACTORY SERVICE IN THIS REGARD, BHEL SHALL MAKE ALTERNATE ARRANGEMENT AT THE COST & RISK OF CONTRACTOR INCLUDING PENAL LEVY OF 25 % OVER THE ABOVE SPECIFIED RATE. THIS WILL BE IN ADDITION TO 30 % OVERHEAD OF BHEL

4.11

THE DISTANCES INDICATED IN THESE SPECIFICATIONS ARE ONLY APPROXIMATE. HOWEVER, THE TENDERERS SHOULD ASSESS THE VARIOUS DISTANCES AND SITE CONDITIONS BY VISITING SITE BEFORE SUBMITTING THEIR OFFER. NO ADDITIONAL/EXTRA CLAIMS FOR ANY VARIATION IN THIS REGARD WILL BE ENTERTAINED.

4.12 EXCLUSIONS

THE FOLLOWING WORKS ARE SPECIFIC EXCLUSIONS FROM THE SCOPE OF WORK UNDER ERECTION, TESTING & COMMISSIOINING OF TENDER SPECIFICATION, HOWEVER THESE ARE COVERED UNDER MATERIAL HANDLING AND MATERIAL MANAGEMENT SCOPE OF WORK :-

I) SOME SUB-DELIVERY ITEMS AND ELECTRICAL COMPONENTS SUCH AS PUSH-BUTTONS, JUNCTION BOXES ETC.

II) E&C WORK OF CABLE TRAYS, CABLES AND EARTHING ETC

III) CONTROL PANELS, EPMS, MCC ETC.

IV) ELECTRICAL & C&I ITEMS OF HANDLING SYSTEM (PG 99)

V) ALL ELECTRICAL AND CONTROL & INSTRUMENTATION ITEMS EXCEPT THOSE SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

VI) CIVIL WORKS EXCEPT TO THE EXTENT SPECIFICALLY INDICATED ELSEWHERE IN THIS TENDER.

VII) REFRACTORY & INSULATION (Excepting insulation between ESP Inner and Outer roofs).

VIII) PNEUMATIC COPPER TUBING AND FITTINGS THEREOF.

IX) ELECTRONIC PROBE/ELECTRONIC COMPONENTS OF ASH LEVEL INDICATORS.

X) TESTING AND COMMISSIONING OF HEATING ELEMENTS, THERMOSTATS, HV RECTIFIER TRANSFORMERS.

XI) ELECTRICAL AND C&I ITEMS OF VARIABLE FREQUENCY DRIVES AS PROVIDED ELSEWHERE IN THESE SPECIFICATIONS.

XII) FINAL PAINTING

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

5.0 **OBLIGATIONS OF THE CONTRACTOR (TOOLS, TACKLES, CONSUMABLES ETC.)**

5.1 ACCOMMODATION, DRINKING WATER & LOCAL TRANSPORTATION FOR THE LABOUR OTHER EMPLOYEES

BHEL/CLIENT IS NOT PROVIDING ANY SPACE FOR LABOUR COLONY. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR ACCOMODATION WITH NECESSARY FACILITIES ETC FOR HIS WORKMEN AND THE STAFF OUT SIDE THE PROJECT PREMISES. ALSO, THE CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENT FOR TRANSPORTATION OF HIS WORKMEN AND OTHER EMPLOYEES. BHEL/CLIENT SHALL NOT PROVIDE ANY FACILITY IN THIS REGARD.

5.2 TOOLS AND TACKLES, MEASURING AND MONITORING DEVICES:

5.2.1
THE CONTRACTOR SHALL PROVIDE ALL (EXCEPTING THOSE INDICATED IN BHEL SCOPE) REQUIRED TOOLS AND PLANTS, MONITORING AND MEASURING DEVICES (MMD) AND HANDLING & TRANSPORTATION EQUIPMENTS FOR THE SCOPE OF WORK COVERED UNDER THESE SPECIFICATIONS. CONTRACTOR SHALL HAVE TO PROVIDE SUITABLE CRANES FOR MATERIAL HANDLING AT BHEL/CLIENT'S STORES/STORAGE YARD, MATERIAL HANDLING YARD / SIDING. **BHEL'S CRANE WILL NOT BE AVAILABLE FOR THIS PURPOSE. PLEASE REFER RELEVANT APPENDIX FOR THE LIST OF T&P BEING PROVIDED BY BHEL FREE OF CHARGES ON SHARING BASIS.**

5.2.2
ALL TOOLS AND TACKLES TO BE DEPLOYED BY THE CONTRACTOR FOR THE WORK SHALL HAVE THE PRIOR APPROVAL OF BHEL ENGINEER WITH REGARD TO BRAND, QUALITY AND SPECIFICATION. INDICATIVE LIST OF MAJOR T&P TO BE ARRANGED BY THE CONTRACTOR HAS BEEN FURNISHED IN RELEVANT APPENDIX. CONTRACTOR SHALL ALSO MOBILIZE ALL OTHER T&P NECESSARY FOR TIMELY AND SATISFACTORY COMPLETION OF THE WORK IN SCOPE.

5.2.3
CONTRACTOR'S RESPONSIBILITIES WITH REGARD TO OPERATOR, FUEL, LUBRICANTS AND DAILY UPKEEP OF T&P PROVIDED BY BHEL IS FURTHER DETAILED IN SECTION-7.

5.2.4
TIMELY DEPLOYMENT OF ADEQUATE QUANTITY OF T&P IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE PREPARED TO AUGMENT THE T & P AT SHORT NOTICE TO MATCH THE PLANNED PROGRAMME AND TO ACHIEVE THE MILESTONES.

5.2.5
CONTRACTOR SHALL MAINTAIN AND OPERATE HIS TOOLS AND PLANTS IN SUCH A WAY THAT MAJOR BREAKDOWNS ARE AVOIDED. IN THE EVENT OF MAJOR BREAKDOWN, CONTRACTOR SHALL MAKE ALTERNATIVE ARRANGEMENTS EXPEDITIOUSLY SO THAT THE PROGRESS OF WORK IS NOT HAMPERED.

5.2.6
IN THE EVENT OF CONTRACTOR FAILING TO ARRANGE THE REQUIRED TOOLS, PLANTS, MACHINERY, EQUIPMENT, MATERIAL OR NON-AVAILABILITY OF THE SAME OWING TO BREAKDOWN, BHEL WILL MAKE THE ALTERNATIVE ARRANGEMENT AT THE RISK AND COST OF THE CONTRACTOR.

5.2.7
THE T&P TO BE ARRANGED BY THE CONTRACTOR SHALL BE IN PROPER WORKING CONDITION AND THEIR OPERATION SHALL NOT LEAD TO UNSAFE CONDITION. THE MOVEMENTS OF CRANES,

AND OTHER EQUIPMENT SHOULD BE SUCH THAT NO DAMAGE / BREAKAGE OCCURS TO FOUNDATIONS, OTHER EQUIPMENTS, MATERIAL, PROPERTY AND MEN. ALL ARRANGEMENTS FOR THE MOVEMENT OF THE T&P ETC SHALL BE THE CONTRACTOR'S RESPONSIBILITY.THE NECESSARY TEST CERTIFICATES FOR EQUIPMENTS TO BE SUBMITTED.

5.2.8
USE OF WELDING GENERATORS/ RECTIFIERS FOR WELDING ONLY SHALL BE PERMITTED. USE OF WELDING TRANSFORMERS WILL BE SUBJECT TO SPECIFIC APPROVAL OF BHEL ENGINEER.

5.2.9
THE CONTRACTOR AT HIS COST SHALL CARRY OUT PERIODICAL TESTING OF HIS CONSTRUCTION EQUIPMENTS AND CALIBRATION OF MEASURING & MONITORING DEVICES (MMD). TEST/ CALIBRATION CERTIFICATES SHALL BE FURNISHED TO BHEL. MMDS SHALL BE CALIBRATED ONLY AT ACCREDITED LABORATORY AS PER THE LIST AVAILABLE WITH BHEL OR ANY OTHER LABORATORY APPROVED BY BHEL.

5.2.10
BHEL T&P WILL BE ISSUED IN BASIC ASSEMBLED CONDITION, CONTRACTOR SHALL TRANSPORT THESE T&P TO & FRO BETWEEN BHEL STORES AND SITE. ADDITIONAL LOOSE COMPONENTS / SUB-ASSEMBLIES / ATTACHMENTS AS AND WHEN NECESSARY, WILL BE ISSUED BY BHEL, TO & FRO BETWEEN BHEL STORES AND SITE OF SUCH ITEMS SHALL ALSO BE DONE BY THE CONTRACTOR. ASSEMBLY OF SUCH ADDITIONAL LOOSE COMPONENTS/SUB-ASSEMBLIES/ ATTACHMENTS IS IN CONTRACTOR'S SCOPE. ANY BOOM REDUCTION/ EXTENSION OF BHEL CRANES FOR CONTRACTOR'S USE AND RESTORATION TO PREVIOUS STATE OR AS DIRECTED BY BHEL SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL PROVIDE ALL ENABLING SERVICES WITH TOOLS AND TACKLES FOR ASSEMBLY/DISMANTLING AND BOOM EXTENSION/REDUCTION AS ABOVE.

5.3 CONSUMABLES

5.3.1
THE CONTRACTOR SHALL PROVIDE ALL CONSUMABLES REQUIRED FOR CARRYING OUT THE WORK COVERED UNDER THESE SPECIFICATIONS EXCEPTING THOSE SPECIFICALLY INDICATED AS BHEL SCOPE.

5.3.2
ALL CONSUMABLES TO BE USED FOR THE WORK SHALL HAVE PRIOR APPROVAL OF BHEL ENGINEER WITH REGARD TO BRAND AND QUALITY SPECIFICATIONS. TEST REPORTS / CERTIFICATES IN RESPECT OF THESE CONSUMABLES, WHEREVER APPLICABLE, SHALL BE SUBMITTED TO BHEL ENGINEER.

5.3.3 PRIMERS & PAINTS

ALL PRIMERS AND PAINTS IS IN THE CONTRACTOR'S SCOPE UNLESS PROVIDED OTHERWISE IN BHEL SCOPE AS FREE ISSUE.

5.3.4 COSUMABLES FOR BHEL SUPLLIED EQUIPMENTS (CRANES, T & P ETC)

REFER RELEVANT CLAUSE OF SECTION-7 SPECIAL CONDITIONS OF CONTRACT IN THIS REGARD.

5.3 WELDING ELECTRODES, FILLER WIRES FOR TIG WELDING AND GASES

5.4.1
ALL THE REQUIRED WELDING ELECTRODES, EXCEPT THOSE INDICATED AS BHEL SCOPE ELSEWHERE IN THESE SPECIFICATIONS, AS APPROVED BY BHEL SHALL BE ARRANGED BY CONTRACTOR AT HIS COST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PRIOR APPROVAL OF BHEL, BEFORE PROCUREMENT, REGARDING MANUFACTURER, TYPE OF ELECTRODES ETC. ON RECEIPT OF THE ELECTRODES AT SITE, IT SHALL BE SUBJECT TO

INSPECTION AND APPROVAL BY BHEL REGARDING TYPE OF ELECTRODES, BATCH NUMBER, DATE OF EXPIRY ETC. BATCH TEST CERTIFICATES SHALL BE MADE AVAILABLE FOR VERIFICATION & RECORD BEFORE THE ACTUAL USE OF THE WELDING CONSUMABLES.

BHEL RESERVES THE RIGHT TO REJECT THE USE OF ANY ELECTRODES, IF FOUND NON-ACCEPTABLE BECAUSE OF BAD QUALITY, DETERIORATION IN QUALITY DUE TO IMPROPER STORAGE, SHELF LIFE EXPIRY, UNAPPROVED TYPE / BRAND ETC.

5.4.2
FILLER WIRES, FOR TIG WELDING OF PRESSURE PARTS & PIPING, TO THE EXTENT SUPPLIED BY THE MANUFACTURING UNITS OF BHEL ALONGWITH THE COMPONENTS / EQUIPMENTS ONLY SHALL BE PROVIDED BY BHEL AS FREE ISSUE. CONTRACTOR SHALL AT HIS COST MEET REQUIREMENTS OF TIG FILLER WIRES, IF ANY, BEYOND THESE FREE ISSUE BY BHEL. SIMILARLY, BHEL WILL PROVIDE AS FREE ISSUE THE WELDING ELECTRODE FOR WELDING OF T-91/P-91 MATERIAL TUBES/PIPES RELEASED AS PART OF SUPPLY FROM MANUFACTURING UNIT OF BHEL.

5.4.3
GASES LIKE ARGON, OXYGEN, ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST. **ARGON GAS FOR P-91/T-91 SITE WELD JOINTS SHALL CONFORM TO GRADE-II OF IS:5760.**

5.4.4
NITROGEN GAS, IF REQUIRED, FOR PRESERVATION OF BOILER AND NITROGEN CAPPING DURING CHEMICAL CLEANING PROCESS, WILL BE PROVIDED BY BHEL FREE OF CHARGE. CONTRACTOR SHALL ARRANGE NECESSARY CONNECTOR, NIPPLE, REGULATOR, HEADER AND PIPING FOR USAGE OF SUCH GAS FROM CYLINDERS.

5.5 FIELD OFFICE

5.5.1
THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR FIELD OFFICE AND STORES FOR ACCOMMODATING NECESSARY EQUIPMENTS, TOOLS ROOM FOR EXECUTION OF THE WORK. ONLY OPEN SPACE WILL BE PROVIDED BY BHEL / CUSTOMER, FREE OF CHARGES WITHIN THE PROJECT PREMISES AS PER THE AVAILABILITY OF SPACE.

5.5.2
ON COMPLETION OF WORK, ALL THE TEMPORARY BUILDINGS, STRUCTURES, PIPELINES, CABLES, ETC SHALL BE DISMANTLED AND LEVELED AND DEBRIS SHALL BE REMOVED AS PER INSTRUCTION OF BHEL BY THE CONTRACTOR AT HIS COST. IN THE EVENT OF HIS FAILURE TO DO SO, THE SAME WILL BE ARRANGED TO BE REMOVED AND EXPENDITURE THEREOF WILL BE RECOVERED FROM THE CONTRACTOR. THE DECISION OF BHEL ENGINEER IN THIS REGARD SHALL BE FINAL. HOWEVER, THE SCOPE OF DISMANTLING AND LEVELING THE AREA IS LIMITED ONLY TO THE CONTRACTOR'S SITE OFFICE, YARD AND OTHER SPACES OCCUPIED BY THE CONTRACTOR.

5.6 AREA LIGHTING

5.6.1

CONTRACTOR SHALL ARRANGE ADEQUATE FLOODLIGHTS, HAND LAMPS AND AREA LIGHTING FOR MATERIAL HANDLING, UNLOADING, VERIFICATION, STACKING, ERECTION, PRE-ASSEMBLY ACTIVITIES ETC. ALL TEMPORARY WIRING MUST COMPLY WITH REGULATIONS AND WILL BE SUBJECTED TO ENGINEER'S INSPECTION BEFORE CONNECTING TO SUPPLY POINT. CONTRACTOR SHALL USE HIS OWN MATERIALS LIKE CABLES, FUSES, SWITCH-BOARDS ETC. BHEL/CLIENT WILL NOT PROVIDE ANYTHING IN THIS REGARD.

5.7 CONSTRUCTION POWER & WATER

5.7.1
CONSTRUCTION POWER (THREE PHASE, 415V / 440V) WILL BE PROVIDED AT ONE POINT NEAR THE SITE APPROXIMATLY 500 METERS FROM ERECTION SITE FREE OF CHARGE, HOWEVER ALL TAXES, DUTIES, LEVIES ETC. SHALL BE BORNE BY THE CONTRACTOR. REQUIRED ENERGY METER, ALL CABLES, FUSES, DISTRIBUTION BOARDS, SWITCHES, SWITCHBOARDS, BUS BARS, EARTHING ARRANGEMENTS, PROTECTION DEVICES e.g. ELCB, IF ANY, AND ANY OTHER INSTALLATION AS SPECIFIED BY STATUTORY AUTHORITY, CLIENT IN THIS REGARD, FOR DRAWL OF CONSTRUCTION POWER SHALL BE ARRANGED BY THE CONTRACTOR. OBTAINING APPROVALS, PAYMENT OF NECESSARY FEES, DUTIES ETC TOWARDS THE CLEARANCE OF SUCH INSTALLATIONS, PRIOR TO THESE BEING PUT TO USE OR AS MAY BE SPECIFIED, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. IT MAY BE NOTED DISTANCE OF 500 M IS ONLY AN ESTIMATED DISTANCE. IT MAY VARY TO ANY EXTENT DEPENDING UPON SITE CONDITIONS.

5.7.2
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE, MAINTAIN THE COMPLETE INSTALLATION ON THE LOAD SIDE OF THE SUPPLY WITH DUE REGARD TO THE SAFETY REQUIREMENTS AT SITE. ALL CABLING AND INSTALLATIONS SHALL COMPLY IN ALL RESPECTS WITH THE APPROPRIATE STATUTORY REQUIREMENTS. THE INSTALLATION AND MAINTENANCE OF THIS SHALL BE DONE BY LICENSED AND EXPERIENCED ELECTRICIAN.

5.7.3
THE CUSTOMER WILL PROVIDE WATER FOR CONSTRUCTION PURPOSE AT A SINGLE POINT FREE OF CHARGE. HOWEVER, TAXES, DUTIES, LEVIES, CHARGES, IF ANY, SHALL BE BORNE BY THE CONTRACTOR. ALL ARRANGEMENTS FOR FURTHER DISTRIBUTION BEYOND THIS POINT HAVE TO BE MADE BY THE CONTRACTOR.

5.7.4
CONTRACTOR SHALL BE WELL EQUIPPED WITH BACK-UP POWER SUPPLY ARRANGEMENT LIKE DG SET AND DIESEL OPERATED WELDING MACHINE ETC. TO TACKLE SITUATIONS ARISING DUE TO FAILURE OF CUSTOMER SUPPLIED POWER, SO AS TO ENSURE CONTINUITY AND COMPLETETION OF CRITICAL PROCESSES THAT ARE UNDERWAY AT THE TIME OF POWER FAILURE OR IMPORTANT ACTIVITIES PLANNED IN IMMEDIATE FUTURE.

5.7.5
BHEL IS NOT RESPONSIBLE FOR ANY LOSS OR DAMAGE TO THE CONTRACTOR'S EQUIPMENT AS A RESULT OF VARIATIONS IN VOLTAGE OR FREQUENCY OR INTERRUPTIONS IN POWER SUPPLY.

5.8 RESPONSIBILITIES WITH REGARD TO LABOUR EMPLOYMENT ETC.

REFER CLAUSE 2.8 OF GENERAL CONDITIONS OF CONTRACT ALSO IN THIS REGARD.

5.8.1
CONTRACTOR SHALL ALSO COMPLY WITH THE REQUIREMENTS OF LOCAL AUTHORITIES/ PROJECT AUTHORITIES CALLING FOR POLICE VERIFICATION OF ANTECEDENTS OF THE WORKMEN, STAFF ETC.

5.8.2
BHEL / CUSTOMER MAY INSIST FOR WITNESSING THE REGULAR PAYMENT TO THE LABOUR. THEY MAY ALSO LIKE TO VERIFY THE RELEVANT RECORDS FOR COMPLIANCE WITH STATUTORY REQUIREMENTS. CONTRACTOR SHALL ENABLE SUCH FACILITIES TO BHEL / CUSTOMER.

5.8.3
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE GATE PASS FOR ALL HIS EMPLOYEES, T&P ETC FOR ENTERING THE PROJECT PREMISES. NECESSARY COORDINATION WITH CUSTOMER OFFICIALS IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR TO FOLLOW ALL THE PROCEDURES LAID DOWN BY THE CUSTOMER FOR MAKING GATE PASSES. WHERE PERMITTED, BY CUSTOMER / BHEL, TO WORK BEYOND NORMAL WORKING HOURS, THE

CONTRACTOR SHALL ARRANGE NECESSARY WORK PERMITS FOR WORKING BEYOND NORMAL WORKING HOURS.

5.8.4.
CONTRACTOR SHALL PROVIDE AT DIFFERENT ELEVATION SUITABLE ARRANGEMENT FOR URINAL AND DRINKING WATER FACILITY WITH NECESSARY PLUMBING & DISPOSAL ARRANGEMENT INCLUDING CONSTRUCTION OF SEPTIC TANK. THESE INSTALLATIONS SHALL BE MAINTAINED IN HYGENIC CONDITION AT ALL TIMES.

5.9
IF AT ANY TIME DURING THE EXECUTION OF WORK, IT IS NOTICED THAT THE WORK IS SUFFERING ON ACCOUNT OF NON-AVAILABILITY/SHORTFALL IN PROVISION OF RESOURCES FROM THE CONTRACTOR'S SIDE, BHEL WILL MAKE SUITABLE ALTERNATE ARRANGEMENTS AT THE RISK AND COST OF CONTRACTOR. THE EXPENDITURE INCURRED WITH OVERHEADS THEREON SHALL BE RECOVERED FROM THE CONTRACTOR.

5.10 **TAXES, DUTIES, LEVIES**

5.10.1 REFER TO CLAUSE 2.8.4 OF GENERAL CONDITIONS OF CONTRACT WHEREIN IT HAS BEEN MENTIONED AS BELOW:

"THE CONTRACTOR SHALL PAY ALL TAXES, FEES, LICENSE CHARGES, DEPOSITS, DUTIES, TOLLS, ROYALTY, COMMISSIONS OR OTHER CHARGES WHICH MAY BE LEVIABLE ON ACCOUNT OF HIS OPERATIONS IN EXECUTING THE CONTRACT. IN CASE BHEL IS FORCED TO PAY ANY OF SUCH TAXES, BHEL SHALL HAVE THE RIGHT TO RECOVER THE SAME FROM HIS BILLS OR OTHERWISE AS DEEMED FIT". NOTWITHSTANDING THE AFORESAID, FOLLOWING PROVISIONS SHALL BE APPLICABLE FOR THIS CONTRACT.

5.10.2 **SERVICE TAX & CESS ON SERVICE TAX**

SERVICE TAX AND CESS ON IT ARE **EXCLUDED** FROM CONTRACTOR'S SCOPE; THEREFORE CONTRACTOR'S PRICE/RATES SHALL BE EXCLUSIVE OF SERVICE TAX AND CESS ON SERVICE TAX. IN CASE, IT BECOMES MANDATORY FOR THE CONTRACTOR UNDER PROVISIONS OF RELEVANT ACT/LAW TO COLLECT THE SERVICE TAX FROM BHEL AND DEPOSIT THE SAME WITH THE CONCERNED TAX AUTHORITIES, THE AMOUNT WILL BE PAID BY BHEL. CONTRACTOR SHALL SUBMIT TO BHEL DOCUMENTARY EVIDENCE OF REMITTANCE OF SUCH TAX IMMEDIATELY AFTER DEPOSITING THE TAX WITH CONCERNED AUTHORITIES. CONTRACTOR SHALL OBTAIN PRIOR WRITTEN CONSENT FROM BHEL BEFORE BILLING THE AMOUNT TOWARDS SUCH TAXES.

5.10.3 NEW LEVIES/TAXES

IN CASE THE GOVERNMENT IMPOSES ANY NEW LEVY/TAX AFTER AWARD OF THE WORK, THE SAME SHALL BE REIMBURSED BY BHEL AT ACTUAL. NO REIMBURSEMENT ON ACCOUNT OF INCREASE IN THE RATE OF EXISTING TAXES, LEVIES ETC. SHALL BE MADE.

5.11 SUBMISSION OF PERIODICAL REPORTS

CONTRACTOR SHALL SUBMIT PERIODICAL REPORTS IN RESPECT OF FOLLOWING ASPECTS OF OPERATION:

1) CONSUMPTION OF CONSUMABLES LIKE WELDING ELECTRODES, GASES AND PAINTS
2) CONSUMPTION OF CONSTRUCTION POWER
3) AVAILABILITY AND UTILIZATION OF BHEL'S TOOLS & PLANTS
4) AVAILABILITY AND UTILIZATION OF CONTRACTOR'S TOOLS & PLANTS
5) DAILY MANPOWER REPORTS
6) DAILY PROGRESS REPORTS OF ACTIVITIES & INCIDENTS
7) CALIBRATION REPORTS
8) RECORDS OF WAGES PAYMENT
9) ANY OTHER REPORT/RECORD AS MAY BE SPECIFIED BY BHEL/CLIENT.

SECTION-6

SPECIAL CONDITIONS OF CONTRACT

6.0 CONTRACTOR'S OBLIGATION IN REGARD TO EMPLOYMENT OF SUPERVISORY STAFF AND WORKMEN

6.1

THE CONTRACTOR SHALL DEPLOY ALL THE SKILLED/SEMISKILLED/ UNSKILLED LABOUR INCLUDING HIGHLY SKILLED WORKMEN ETC. THESE WORKMEN SHOULD HAVE PREVIOUS EXPERIENCE ON SIMILAR JOB. THEY SHALL HOLD VALID CERTIFICATES WHEREVER NECESSARY. BHEL RESERVES THE RIGHT TO INSIST ON REMOVAL OF ANY EMPLOYEE OF THE CONTRACTOR AT ANY TIME IF HE IS FOUND TO BE UNSUITABLE AND THE CONTRACTOR SHALL FORTHWITH REMOVE HIM. CONTRACTOR SHOULD FURNISH A TENTATIVE DEPLOYMENT PLAN OF HIS MANPOWER AS REQUIRED VIDE APPENDIX-VI. ALSO THE ACTUAL DEPLOYMENT WILL BE SO AS TO SATISFY THE ERECTION AND COMMISSIONING TARGETS SET BY BHEL.

6.2

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENGAGE HIS WORKMEN IN SHIFTS AND OR ON OVERTIME BASIS FOR ACHIEVING THE TARGETS SET BY BHEL. THIS TARGET MAY BE SET TO SUIT BHEL'S COMMITMENTS TO ITS CUSTOMER OR TO ADVANCE DATE OF COMPLETION OF EVENTS OR DUE TO OTHER REASONS. THE DECISION OF BHEL IN REGARD TO SETTING THE ERECTION AND COMMISSIONING TARGETS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

6.3

CONTRACTOR SHALL DEPLOY ONLY QUALIFIED AND EXPERIENCED ENGINEERS/ SUPERVISORS. THEY SHALL HAVE PROFESSIONAL APPROACH IN EXECUTING THE WORK.

6.4

THE CONTRACTOR'S SUPERVISORY STAFF SHALL EXECUTE THE WORK IN THE MOST PROFESSIONAL MANNER IN THE STIPULATED TIME. ACCURACY OF WORK AND AESTHETIC FINISH ARE ESSENTIAL PART OF THIS CONTRACT. THEY SHALL BE RESPONSIBLE TO ENSURE THAT THE ASSEMBLY AND WORKMANSHIP CONFORM TO DIMENSIONS AND TOLERANCES GIVEN IN THE DRAWINGS/INSTRUCTIONS GIVEN BY BHEL ENGINEER FROM TIME TO TIME.

6.5

THE SUPERVISORY STAFF EMPLOYED BY THE CONTRACTOR SHALL ENSURE PROPER OUTTURN OF WORK AND DISCIPLINE ON THE PART OF THE LABOUR PUT ON THE JOB BY THE CONTRACTOR. ALSO IN GENERAL THEY SHOULD SEE THAT THE WORKS ARE CARRIED OUT IN A SAFE AND PROPER MANNER AND IN COORDINATION WITH OTHER LABOUR AND STAFF EMPLOYED DIRECTLY BY BHEL OR OTHER CONTRACTORS OF BHEL OR BHEL'S CLIENT.

6.7

IF AT ANY TIME, IT IS FOUND THAT THE CONTRACTOR IS NOT IN A POSITION TO DEPLOY THE REQUIRED ENGINEERS/SUPERVISORS/WORKMEN DUE TO ANY REASON, BHEL SHALL HAVE THE OPTION TO MAKE ALTERNATE ARRANGEMENTS AT THE CONTRACTOR'S RISK AND COST.

6.8 SITE ORGANISATION

THE CONTRACTOR SHALL PROVIDE ADEQUATE STAFFING IN THE FOLLOWING AREAS IN ADDITION TO THE STAFFING REQUIREMENTS OF EXECUTION AS INSTRUCTED/INFORMED BY BHEL FROM TIME TO TIME:

a) MATERIAL HANDLING
b) MATERIAL MANAGEMENT
c) OVERALL PLANNING, MONITORING & CONTROL
d) QUALITY CONTROL AND QUALITY ASSURANCE
e) SAFETY, FIRE & SECURITY
f) INDUSTRIAL RELATIONS AND FULFILLMENT OF LABOUR LAWS AND OTHER STATUTORY OBLIGATIONS.

SECTION-7

SPECIAL CONDITIONS OF CONTRACT

7.0 OBLIGATIONS OF BHEL

7.1 FACILITIES TO BE PROVIDED BY BHEL

7.1.1 SPACE FOR SITE OFFICE / STORES

REFER SECTION-5 IN THIS REGARD.

7.1.2 CONSTRUCTION POWER & WATER

REFER SECTION-5 IN THIS REGARD.

7.1.3 OTHER MATERIALS AND CONSUMABLES:

BHEL SHALL NOT PROVIDE ANY MATERIAL / CONSUMABLES EXCEPT THOSE SPECIFICALLY MENTIONED AS BHEL SCOPE IN THESE SPECIFICATIONS.

7.1.4 TEST MATERIALS (PLATES & PIPES)

BHEL WILL PROVIDE THE RAW MATERIAL FREE OF CHARGES FOR PREPARATION OF TEST PIECES FOR CONDUCTING THE SITE QUALIFICATION TEST OF WELDERS. CONTRACTOR SHALL PREPARE THE REQUIRED TEST PIECES FROM SUCH RAW MATERIALS.

7.2 FILLER WIRE FOR TIG WELDING AND WELDING ELECTRODES FOR WELDING OF T-91/P-91 MATERIAL TUBES/PIPES

REFER SECTION-5 IN THIS REGARD.

7.3 EQUIPMENTS – TOOLS & PLANTS

BHEL WILL MAKE AVAILABLE T&P LISTED IN THE RELEVANT APPENDIX FREE OF CHARGE. FURTHER DETAILS ARE AS UNDER:

7.3.1 CRANES TO BE PROVIDED BY BHEL

7.3.1.1

BHEL WILL MAKE AVAILABLE THE CRANE (AS PER **APPENDIX– III)** FREE OF CHARGE TO THE CONTRACTOR ON SHARING BASIS MAINLY FOR THE PURPOSES ENUMERATED VIDE NOTES IN **APPENDIX-III.** BHEL CRANES HAVE TO BE SHARED WITH OTHER AGENCIES / CONTRACTORS OF BHEL. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR.

7.3.1.2

CONTRACTOR SHALL LAY NECESSARY SLEEPER BEDS, BACKFILLING OF APPROACHES WHEREVER NECESSARY FOR SAFE MOVEMENT OF THE CRANES AS DIRECTED BY BHEL. CONTRACTOR SHALL TRANSPORT THE EQUIPMENTS AND COMPONENTS/SUB ASSEMBLIES/ATTACHMENTS OF BHEL EQUIPMENTS TO & FRO BETWEEN BHEL STORES AND SITE.

7.3.1.3

CRANES, INCLUDING THE CRANE HIRED BY BHEL, WILL BE INITIALLY ISSUED IN BASIC ASSEMBLED CONDITION. ANY ALTERATION/ADDITION LIKE BOOM REDUCTION/EXTENSION, ASSEMBLY OF COMPONENTS/SUB-ASSEMBLIES NEEDED FOR MODULATING THE CAPACITY/REACH/OTHER FEATURES OF CRANES AND RESTORATION TO THE STATE AS DIRECTED BY BHEL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

7.3.1.4

THE DAY-TO-DAY UPKEEP AND RUNNING MAINTENANCE LIKE FILLING / TOPPING UP OF LUBRICANTS, CHANGING FILTERS ETC, OF BHEL CRANES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SPARES IF ANY, REQUIRED IN NORMAL COURSE WILL BE PROVIDED BY BHEL. MAJOR BREAKDOWNS WILL BE ATTENDED TO BY BHEL. THE CRANES PROVIDED BY BHEL WILL BE

WITHDRAWN FOR REGULAR AND CAPITAL MAINTENANCE AS PER THE RESPECTIVE SCHEDULE OF MAINTENANCE. AS FAR AS POSSIBLE SUCH SCHEDULES WILL BE INTIMATED TO THE CONTRACTOR IN ADVANCE AND MAY BE ADJUSTED DEPENDING ON THE WORK REQUIREMENTS AT SITE. HOWEVER NO CLAIM WHATSOEVER WILL BE ENTERTAINED ON ACCOUNT OF NON-AVAILABILITY OF CRANES.

7.3.1.5
CONTRACTOR SHALL PROVIDE THE FUEL FOR THE 300T HIRED CRANE FOR WHICH OPERATOR WILL BE PROVIDED BY THE CRANE HIRING AGENCY OF BHEL. HOWEVER, FOR 18 T CRAWLER CRANE THE CONTRACTOR SHALL PROVIDE THE FUEL AND THE OPERATOR & HELPER ETC.

7.3.1.6
WHERE THE SERVICES OF THE CRANES PROVIDED BY BHEL ARE TO BE SHARED BY OTHER AGENCIES/ CONTRACTORS OF BHEL, THE CONTRACTOR'S RESPONSIBILITIES DEFINED ABOVE WILL ALSO BE APPORTIONED ACCORDINGLY TO THE BENEFICIARY AGENCY. WORKING ARRANGEMENTS IN THIS REGARD WILL BE DONE AT SITE BY BHEL ENGINEER AND IN ANY CASE HIS DECISION SHALL BE FINAL AND BINDING.

7.4 OTHER T&P

7.4.1
THE RESPONSIBILITIES OF CONTRACTOR DEFINED ABOVE FOR BHEL CRANES SHALL ALSO BE APPLICABLE, MUTATIS – MUTANDIS, IN RESPECT OF OTHER TOOL & PLANTS PROVIDED BY BHEL.

7.4.2
CHEMICAL CLEANING EQUIPMENTS THAT HAVE TO BE USED IN TEMPORARY INSTALLATIONS FOR THE RESPECTIVE PURPOSE HAVE TO BE SERVICED BY THE CONTRACTOR PRIOR TO USE. BHEL WILL PROVIDE NECESSARY SPARES, PACKING ETC FREE OF CHARGE FOR THE SAME. THESE HAVE TO BE RETURNED TO BHEL AFTER DUE SERVICING AND PRESERVATION.

7.4.3
~~DRUM LIFTING KIT i.e. WINCHES, PULLEY ETC HAVE TO BE SERVICED BY THE CONTRACTOR PRIOR TO USE. SPARES, REQUIRED IF ANY, WILL BE PROVIDED BY BHEL FREE OF CHARGE.~~

7.4.4
SPECIAL TOOLS WHICH ARE SUPPLIED BY BHEL AS PART OF MAINTENANCE TOOLS TO BE HANDED OVER TO CUSTOMER UNDER REGULAR DU / DESS NUMBERS IN VARIOUS PRODUCT GROUPS MAY BE ISSUED TO THE CONTRACTOR FREE OF CHARGES FOR SPECIFIC ACTIVITIES, AT THE DISCRETION OF BHEL. CONTRACTOR SHALL RETURN THEM AFTER THE COMPLETION OF THE SPECIFIC ACTIVITY FOR WHICH THE TOOLS WERE SPARED, IN GOOD WORKING ORDER.

7.4.5
LUBRICANTS LIKE ENGINE OIL, CARDIUM COMPOUND, HYDRAULIC OIL, GEAR OIL, GREASE ETC FOR BHEL'S T&P INCLUDING CRANES WILL BE PROVIDED BY BHEL FREE OF CHARGE. SIMILARLY FILTERS FOR CRANES WILL BE PROVIDED FREE OF CHARGE BY BHEL. ALL OTHER CONSUMABLES LIKE COTTON WASTE, CLEANING AGENTS ETC SHALL BE IN THE CONTRACTOR'S SCOPE.

7.4.6
THE CONTRACTOR MUST NOT USE THESE EQUIPMENTS FOR ANY PURPOSE OTHER THAN WHAT THEY ARE INTENDED FOR.

7.4.7
IF THE ABOVE ITEMS ISSUED TO CONTRACTOR ARE FOUND NOT UTILISED / NOT MAINTAINED TO THE SATISFACTION OF BHEL ENGINEER OR MISUSED, THESE WILL BE WITHDRAWN AND NO REPLACEMENT WILL BE DONE FOR SUCH ITEMS.

7.4.8
REQUIRED TEMPORARY STRUCTURAL STEEL, PIPES & FITTINGS, VALVES FOR DRUM LIFTING, CONDUCT OF HYDRAULIC TEST, CHEMICAL CLEANING / STEAM BLOWING / OIL FLUSHING / ACID CLEANING ETC SHALL BE PROVIDED BY BHEL.

7.5 CHEMICALS, GASES AND LUBRICANTS FOR PRE -COMMISSIONING AND COMMISSIONING

7.5.1
ALL LUBRICANTS AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING / ACID CLEANING, OIL FLUSHING, AND THE LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS AND TRIAL OPERATION OF THE UNIT WILL BE SUPPLIED BY BHEL FREE OF CHARGES.

SECTION-8

SPECIAL CONDITIONS OF CONTRACT

8.0 INSPECTION / QUALITY ASSURANCE / STATUTORY INSPECTION

8.1
VARIOUS INSPECTION / QUALITY ASSURANCE PROCEDURES / METHODS AT VARIOUS STAGES OF ERECTION AND COMMISSIONING WILL BE AS PER BHEL / CUSTOMER QUALITY PLANS / CODES / IBR AND OTHER STATUTORY PROVISIONS AND AS PER BHEL ENGINEER'S INSTRUCTIONS.

8.2
PREPARATION OF QUALITY ASSURANCE LOG SHEETS AND PROTOCOLS WITH CUSTOMER/ CONSULTANTS/STATUTORY AUTHORITY, WELDING LOGS, NDE AND POST WELD HEAT TREATMENT RECORDS, TESTING & CALIBRATION RECORDS AND OTHER QUALITY ASSURANCE DOCUMENTATION AS PER BHEL ENGINEER'S INSTRUCTIONS, IS WITHIN THE SCOPE OF WORK/SPECIFICATION. THESE RECORDS SHALL BE SUBMITTED TO BHEL/CUSTOMER FOR APPROVAL FROM TIME TO TIME.

8.3
A DAILY LOGBOOK OF ALL MEASUREMENTS AND TESTING/CALIBRATION SHOULD BE MAINTAINED BY CONTRACTOR ON THE JOB FOR DETAILING INSPECTION DETAILS OF VARIOUS EQUIPMENTS.

8.4
THE PERFORMANCE OF HP WELDERS WILL BE REVIEWED FROM TIME TO TIME AS PER THE BHEL/IBR STANDARDS. HIGH PRESSURE WELDERS' PERFORMANCE RECORD SHALL BE FURNISHED PERIODICALLY. CORRECTIVE ACTION AS INFORMED BY BHEL SHALL BE TAKEN IN RESPECT OF THOSE WELDERS NOT CONFORMING TO THESE STANDARDS. THIS MAY INCLUDE REMOVAL/ DISCONTINUANCE OF CONCERNED WELDER(S). CONTRACTOR SHALL ARRANGE FOR THE ALTERNATE WELDERS IMMEDIATELY.

8.5
ALL THE WELDERS INCLUDING HP WELDERS SHALL CARRY IDENTITY CARDS AS PER THE PROFORMA PRESCRIBED BY BHEL ONLY WELDERS DULY AUTHORISED BY BHEL/BOILER INSPECTOR/CUSTOMER/CONSULTANT SHALL BE ENGAGED ON THE WORK.

8.6
CONTRACTOR SHALL PROVIDE ALL THE MEASURING AND MONITORING DEVICES (MMD) REQUIRED FOR COMPLETION OF THE WORK SATISFACTORILY. THESE MMDS SHALL CONFORM TO JOB REQUIREMENT IN RESPECT OF MEASUREMENT RANGE, ACCURACY LEVEL & ANY OTHER SPECIFICATION.

8.7
THE MMD DEPLOYED BY THE CONTRACTOR SHALL, AT ALL STAGES OF WORK, HAVE VALID AND CURRENT CALIBRATION CERTIFICATE. THE CALIBRATION OF THESE MMDS SHALL BE GOT DONE FROM THE AGENCIES ACCREDITED/ APPROVED BY BHEL/EIL. COPY OF CALIBRATION CERTIFICATES IN RESPECT OF THESE MMD HAS TO BE SUBMITTED TO BHEL. PERIODICAL STATUS REPORT REGARDING VALIDITY OF CALIBRATION HAS TO BE SUBMITTED TO BHEL. RE-CALIBRATION/ RE-VALIDATION SHALL BE DONE FOR THE CONTINUITY OF USAGE , AS PER BHEL SPECIFICATIONS. CONTRACTOR SHALL CONFORM TO THE SPECIFICATIONS OF BHEL REGARDING STORAGE OF THE MMD.

8.8

RE-WORK NECESSITATED ON ACCOUNT OF USE OF INVALID MMD SHALL BE ENTIRELY TO THE CONTRACTOR'S ACCOUNT. HE SHALL BE RESPONSIBLE TO TAKE ALL CORRECTIVE ACTIONS, INCLUDING RESOURCE AUGMENTATION IF ANY, AS SPECIFIED BY BHEL TO MAKE-UP FOR THE LOSS OF TIME.

8.9

IN THE COURSE OF WORK BHEL MAY COUNTER/ FINALLY CHECK THE MEASUREMENTS WITH THEIR OWN MMDS. CONTRACTOR SHALL RENDER ALL ASSISTANCE IN CONDUCT OF SUCH COUNTER CHECK / FINAL MEASUREMENTS.

8.10

VIBRATION INDICATORS/VIBRATION RECORDERS/VIBRATION ANALYSERS WILL BE PROVIDED BY BHEL FOR CHECKING AND ANALYSING VIBRATION LEVELS OF ROTATING EQUIPMENTS WITH QUALIFIED OPERATORS. CONTRACTOR SHALL PROVIDED NECESSARY MANPOWER FOR CARRYING OUT SUCH TESTS. SIMILARLY, BHEL WILL PROVIDE THE OSCILLOSCOPE FOR ANY SPECIFIC REQUIREMENT.

8.11

TOTAL QUALITY IS THE WATCHWORD OF THE WORK AND CONTRACTOR SHALL STRIVE TO ACHIEVE THE QUALITY STANDARDS, PROCEDURES LAID DOWN BY BHEL. HE SHALL FOLLOW ALL THE INSTRUCTIONS AS PER BHEL DRAWINGS AND QUALITY STANDARDS. CONTRACTOR SHOULD ENGAGE WELL-QUALIFIED AND EXPERIENCED ENGINEER FOR QUALITY ASSURANCE AND NDT SERVICES.

8.12 STAGE INSPECTION BY FES / QA ENGINEERS

8.12.1

APART FROM DAY-TO-DAY INSPECTION BY BHEL ENGINEERS STATIONED AT SITE AND ALSO BY CUSTOMER'S ENGINEERS, STAGE INSPECTION OF EQUIPMENTS UNDER ERECTION AND COMMISSIONING AT VARIOUS STAGES OF ERECTION AND COMMISSIONING BY TEAMS OF ENGINEERS FROM FIELD ENGINEERING SERVICES OF BHEL'S MANUFACTURING UNITS AND QUALITY ASSURANCE TEAMS FROM FIELD QUALITY ASSURANCE, FACTORY QUALITY ASSURANCE AND COMMISSIONING ENGINEERS FROM TECHNICAL SERVICES OF BHEL / CONSULTANT WILL ALSO BE CONDUCTED. CONTRACTOR SHALL ARRANGE ALL LABOUR, TOOLS AND TACKLES ETC FOR SUCH STAGE INSPECTIONS AS PART OF WORK.

8.13 STATUTORY INSPECTION OF WORK

8.13.1

THE WORK TO BE EXECUTED UNDER THESE SPECIFICATIONS HAS TO BE OFFERED FOR INSPECTION, AT APPROPRIATE STAGES OF WORK TO STATUTORY AUTHORITIES TO COMPLY WITH APPLICABLE REGULATIONS.

8.13.2

THE WORK RELATED STATUTORY INSPECTIONS, THOUGH NOT LIMITED TO, ARE AS UNDER:

1) INSPECTORATE OF STEAM BOILERS AND SMOKE NUISANCE
2) FACTORY INSPECTOR, LABOUR COMMISSIONER, ELECTRICAL INSPECTOR PF COMMISSIONER AND OTHER AUTHORITIY CONNECTED TO THIS PROJECT WORK

THE SCOPE INCLUDES GETTING THE APPROVALS FROM THE STATUTORY AUTHORITIES, WHICH INCLUDES ARRANGING FOR INSPECTION VISITS OF STATUTORY AUTHORITY PERIODICALLY AS PER BHEL ENGINEER'S INSTRUCTIONS, ARRANGING MATERIALS FOR GROUND INSPECTION, TAKING RUB OUTS FOR THE PRESSURE PARTS TO BE OFFERED FOR INSPECTION, SUBMITTING CO-RELATED INSPECTION REPORTS, DOCUMENTS, RADIOGRAPHS ETC AND FOLLOWING UP THE MATTER WITH THEM. CONTRACTOR SHALL ALSO MAKE ALL ARRANGEMENTS FOR OFFERING THE PRODUCTS / SYSTEMS FOR INSPECTION AT LOCATION, AS APPLICABLE, TO THE CONCERNED AUTHORITY.

8.13.3
THE CONTRACTORS SHALL PAY ALL FEES CONNECTED WITH TESTING OF HIS WELDERS / WORKERS AND TESTING, INSPECTION & CALIBRATION OF HIS MMD AND T&P.

8.13.4
IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL OF STATUTORY AUTHORITIES, WHENEVER APPLICABLE, FOR THE CONDUCTING OF ANY WORK WHICH COMES UNDER THE PURVIEW OF THESE AUTHORITIES. ANY COST ARISING FROM THIS SHALL BE CONTRACTOR'S ACCOUNT.

8.13.5
CONTRACTOR SHALL PAY FEES FOR VISITS, INSPECTION FEES ETC OF IBR AUTHORITIES IN ADDITION TO ALL OTHER EXPENSES IN THIS REGARD.

8.13.6
CONTRACTOR SHOULD BE QUALIFIED TO EXECUTE PRESSURE PARTS & PIPING WORK COMING UNDER THE PURVIEW OF IBR, FOR WHICH HE SHOULD REGISTER HIMSELF WITH CIB OF STATE CONCERNED. CONTRACTOR ALSO SHOULD BE AWARE OF THE LATEST IBR REGULATIONS AND ELECTRICITY ACT, INCLUDING THE AMENDMENTS THEREOF.

8.14.0
THE QUALITY MANAGEMENT SYSTEM OF BHEL, POWER SECTOR – WESTERN REGION (PSWR) HAS ALREADY BEEN CERTIFIED AND ACCREDITED UNDER ISO 9001: 2000 STANDARDS IN THIS REGARD. THE BASIC PHILOSOPHY OF THE QUALITY MANAGEMENT SYSTEM IS TO DEFINE THE ORGANIZATIONAL RESPONSIBILITY, WORK AS PER DOCUMENTED PROCEDURES, VERIFY THE OUTPUT WITH RESPECT TO ACCEPTANCE NORMS, IDENTIFY THE NON-CONFORMING PRODUCT/ PROCEDURE AND TAKE CORRECTIVE ACTION FOR REMOVAL OF NON-CONFORMANCE SPECIFYING THE STEPS FOR AVOIDING RECURRENCE OF SUCH NON-CONFORMITIES, & MAINTAIN THE RELEVANT QUALITY RECORDS. THE NON-CONFORMITIES ARE TO BE IDENTIFIED THROUGH THE CONDUCT OF PERIODICAL AUDIT OF IMPLEMENTATION OF QUALITY SYSTEMS AT VARIOUS LOCATIONS/STAGES OF WORK. SUPPLIERS/VENDORS OF VARIOUS PRODUCTS/SERVICES CONTRIBUTING IN THE WORK ARE ALSO CONSIDERED AS PART OF THE QUALITY MANAGEMENT SYSTEM. AS SUCH THE CONTRACTOR IS EXPECTED NOT ONLY TO CONFORM TO THE QUALITY MANAGEMENT SYSTEM OF BHEL BUT ALSO IT IS DESIRABLE THAT THEY THEMSELVES ARE ACCREDITED UNDER ANY QUALITY MANAGEMENT SYSTEM STANDARD.

SECTION-9

SPECIAL CONDITIONS OF CONTRACT

Safety, Occupational Health and Environmental Management

BHEL PSWR has been certified for Environmental Management under ISO 14001:1996 standard and Occupational Health & Safety under OHSAS 18001 by DNV. In order to comply with the above standards, it shall be the endeavour of BHEL and all its subcontractors to meet and implement the requirements by following the guidelines issued under Environmental, Occupational Health and Safety Management (EHS) manual a copy of which will be available with the BHEL Site-in-charge.

Contractor shall also enter into a "Memorandum of Understanding" as given in clause 9.9 in case of award of contract.

9.0 Responsibility of the Contractor in Respect of Safety of Men, Equipment, Material and Environment.

9.1 The Contractor Shall

9.1.1 Abide by the Safety Regulations applicable for the Site/Project and in particular as mentioned in the booklet "Safe Work Practices" issued by BHEL. Contractors are also to ensure that their employees and workmen use safety equipments as stipulated in the Factories Act (Latest Revision) during the execution of the work. Failure to use safety equipment as required by BHEL Engineer will be a sufficient reason for issuance of memo, which shall become part of Safety evaluation of the contractor at the end of the Project. Also all site work may be suspended if it is found that the workmen are employing unsafe working practice and all the costs/losses incurred due to suspension of work shall be borne by contractor. A comprehensive list of National Standards from which the contractor can draw references for complying with various requirements under this section is given under 9.10

9.1.2 Hold BHEL harmless and indemnified from and against all claims, cost and charges under Workmen's Compensation Act 1923 and 1933 and any amendment thereof and the contractor shall be solely responsible for the same.

9.1.3 Abide by the Procedure governing entry/exit of the contractor's personnel within the Customer/Client premises. All the contractors employees shall be permitted to enter only on displaying of authorized Photo passes or any other documents as authorised by the Customer/Client

9.1.4 Be fully responsible for the identity, conduct and integrity of the personnel/workers engaged by them for carrying out the contract work and ensure that none of them are ever engaged in any anti national activity

9.1.5.1 Prepare a signboard giving the following information and display it near work site:

i. Name of Contractor
ii. Name of Contractor Site-in-charge & Telephone number
iii. Job Description in short
iv. Date of start of job
v. Date of expected completion
vi. Name of BHEL Site-in-charge.

9.1.5 Abide by the rules and regulations existing during the contract period as applicable for the contractors at the Project premises.

9.1.6 Observe the timings of work as advised by BHEL Engineer-in-charge for carrying out the contract work.

9.2 **SPECIAL CONDITIONS**

9.2.1 **Safety**

9.2.1.1 **Safety Plan**

Before commencing the work, contractor shall submit a "safety plan" to the authorised BHEL official. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety to men, equipment, material and environment during execution of the work. The plan shall take care to satisfy all requirements specified hereunder.

The contractor shall submit "safety plan" before start of work. During negotiations, before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modifications in the safety plan. Contractor shall abide by BHEL's decision in this respect.

9.2.1.2 The contractor shall take all necessary safety precautions and arrange for appropriate appliances and/or as per direction of BHEL or it's authorised person to prevent loss of human lives, injuries to men engaged and damage to property and environment.

9.2.1.3 The contractor shall provide to his work force and also ensure the use of Personnel Protection Equipment (PPE) as found necessary and/or as directed and advised by BHEL officials without which permission is liable to be denied.

- Safety helmets conforming to IS 2925/1984 (1990)
- Safety belts conforming to IS 3521/1989
- Safety shoes conforming to IS 1989 part-II /1986(1992)
- Eye and face protection devices conforming to IS 2573/1986(1991), IS 6994 (1973), part-I (1991), IS 8807/1978 (1991), IS 8519/1977(1991).
- Other job specific PPEs of standard ISI make as may be prescribed

9.2.1.4 All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, cages, safety nets, ladders, equipment, etc used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorised BHEL official who shall have the right to ban the use of any item found to be unsafe

9.2.1.5 All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carryout all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

9.2.1.6 The contractor shall not use any hand lamp energised by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

9.2.1.7 The contractor shall adopt all fire safety measures as per relevant Indian Standards

9.2.1.8 Where it becomes necessary to provide and/or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provisions and/or storage in accordance with the rules and regulations laid down by the relevant government acts, such as petroleum act, explosives act, petroleum and carbides of calcium manual of the chief controller of explosives, Government of India etc. The contractor in all such matters shall also take prior approval of the authorised BHEL official at the site.

9.2.1.9 Proper means of access must be used e.g. ladders, scaffolds, platforms etc. No makeshift access such as oil drums or pallets shall be used. Design of these will be in accordance with relevant standards and certified by competent persons before use.

9.2.1.10 Temporary arrangements made at Site for lifting , platforms, Approach access etc should be properly designed and approved Before being put to use.

9.2.1.11 All excavations and openings must be securely and adequately fenced/barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.12 No persons shall remove guard rails, covers or protective devices unless authorised by a responsible supervisor and alternative precautions have been taken

9.2.1.13 Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.14 Only authorised persons holding relevant license will drive and operate site plant and equipments eg cranes, dumpers, excavators, transport vehicles etc

9.2.1.15 Only authorised personnel are allowed to repair, commission electrical equipments.

9.2.1.16 Gas cylinders shall be handled and stored as per Gas Cylinder Rules and relevant safe working practices

9.2.1.17 All wastes generated at Site shall be segregated and collected in a designated place so as to prevent spillage/contamination/scattering at Site, until the waste is lifted for disposal to designated disposal area as advised by BHEL official.

9.2.1.18 The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural day light is not adequate for clear visibility.

9.2.1.19 The contractor shall train adequate number of workers/supervisors for administering "FIRST AID". List of competent first aid administers should be prominently displayed.

9.2.1.20 The contractor shall display at strategic places and in adequate numbers the following in fluorescent markings

- Emergency telephone numbers
- Exit, Walkways
- Safe working load charts for wire ropes, slings, D shackles etc
- Warning signs

9.2.1.21 The contractor shall be held responsible for any violation of statutory regulations (local, state or central) and BHEL instructions that may endanger safety of men, equipment, material and environment in his scope of work or other contractors or agencies. Cost of damage, if any, to life and property arising out of such violation of statutory regulations and BHEL instructions shall be borne by the contractor.

9.2.1.22 In case of a fatal or disabling injury/accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the

contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

9.2.1.23 In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover cost of such damages from payments due to the contractor after holding an appropriate enquiry.

9.2.1.24 In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from payments due to the contractor after notifying the contractor suitably and giving him opportunity to present his case.

9.2.1.25 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a reasonable opportunity to do so, and/or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorised BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

9.2.1.26 **Emergency Response**

BHEL will have an Emergency Response Plan for each Project Site in consultation with the Owner as the case may be, detailing the procedure for mobilisation of personnel and equipment, and defining the responsibilities of the personnel indicated, in order to prepare for any emergency that may arise in order to ensure the priorities of

- Safeguard of life
- Protect assets under construction or neighbouring
- Protect environment
- Resumption of normal operations as soon as the emergency condition is called off

All Contractors shall also be part of the Emergency response Plan and the personnel so nominated shall be aware of their duties and responsibilities in an emergency response situation.

9.2.1.27 At least 5% Contractors supervisors and workmen shall undergo training in administering 'First Aid'. The trained persons should represent for all categories of work and for all areas of work. Adequate number of trained persons should be available for each shift. These first aiders shall be included in the emergency response team. Contractor employees and workmen are encouraged to participate in first aid training programmes whenever organised by BHEL.

9.2.2 OCCUPATIONAL HEALTH

9.2.2.1 Specific occupational health hazards will be identified through the hazard evaluation processes in consultation with BHEL engineers and the necessary prevention/reduction/elimination methods implemented.

9.2.2.2 All personnel working in an activity with a potential risk to health shall be made aware of all those risks and the actions they must take to reduce/control/eliminate the risk

9.2.2.3 Safety coordinator shall conduct periodic checks to ensure that every group of workers engaged in similar activities are aware of potential risks to health and the actions required to be taken to mitigate the risk

9.2.2.4 In order to protect personnel from associated health hazards, the following main areas will be focussed

- Issue of approved Personnel Protective Equipment
- Verification that the PPEs are adequate/maintained and worn by all staff involved in operations that are potentially hazardous to their health
- Ensure that the personnel deployed are physically fit for the operation/work concerned
- Provide hygienic and sanitary working conditions

9.2.2.5 Contractor workers employees engaged in noise risk areas shall be issued with hearing protection aids and the use of the same will be enforced. Further, these workers will be educated on the hazards of noise

9.2.2.6 Contractor workers engaged in dust environment shall be issued with necessary dust protection aids and the use of the same shall be enforced

9.2.2.7 Workers engaged in exposure to bright light/rays as in welding or radiation shall be issued with eye protection devices and the use of the same shall be enforced

9.2.2.8 Adequate arrangements shall be made to provide safe drinking water

9.2.2.9 Health monitoring records on at least sample basis for contractor employees & workmen shall be maintained for persons engaged in specified categories of work. These shall include

- Noise induced hearing loss
- Lung Function test
- Ergonomic Test
- Eye Test for Welders, Grinders, Drivers etc

9.2.3.0 HYGIENE and HOUSEKEEPING

9.2.3.1 Good house keeping and proper hygiene is one of the key requirements of Occupational Health Safety and Environment management. Towards this the contractor shall encourage his workers and supervisors to maintain cleanliness in their area of work.

9.2.3.2 The Contractor shall arrange to place waste bins/chutes at convenient locations for the collection of scrap and other wastes. The bins shall be clearly marked and segregated for metal, non-metal, hazardous and non hazardous wastes.

9.2.3.3 BHEL may take up appropriate remedial measures at the cost of the contractors if the contractors fail good house keeping and if there is an imminent risk of pollution

9.2.4 ENVIRONMENT MANAGEMENT

9.2.4.1 BHEL has a sound environmental management system, which is to be maintained and implemented by all the contractors. The system allows for project specific objectives to be set and developed sensitive to client requirements, applicable environmental legislation and BHEL's own objectives and policy. BHEL engineers will assess and monitor the environmental impact of their work and lay out objectives for their minimisation. The contractors shall implement the objectives for continual improvement of environmental performance. BHEL shall regularly audit environmental impacts and their improvements.

9.2.4.2 WASTE MANAGEMENT

9.2.4.3.1 The objective of waste management is to ensure the safe and responsible disposal of waste, ensuring that it is correctly disposed of and being able to audit the process to ensure compliance.

9.2.4.3.2 Chemical wastes if any shall be collected separately and disposed of to BHEL designated refuse yard as per BHEL advise

9.2.4.3.3 No dangerous chemicals, noxious waste products or materials will be disposed off on or off site without approval obtained through BHEL.

9.2.4.3.4 All disposal of wastes generated during construction shall be in accordance with all relevant legislation.

9.2.4.3.5 Acid and alkali cleaning wastes shall be neutralised to acceptable norms before disposal to the designated area.

9.2.4.3.6 All necessary measures shall be taken to ensure safe collection and disposal of waste oils. In particular to ensure the prevention of their discharge into surface waters, ground waters, coastal waters or drainages

9.3 SUPERVISION

9.3.1

Contractor must provide at least one full time on site safety coordinator when the manpower engaged is in excess of 50 for the contract activities in the premises. If the manpower is less than 50, the on site safety coordination responsibilities shall be assumed by any one of the contractor's other supervisory staff; however in both the cases, the contractor must specify in writing the name of such persons to the BHEL Engineer in Charge .

9.3.2

Contractor's safety coordinator or his supervisor responsible for safety as the case may be shall conduct at his work site, and document formal safety inspection and audits at least once in a week. Such documents are to be submitted to BHEL Engineer in Charge for his review and record

Contractor, supervisor must attend all schedule safety meetings as would be intimated to him by the BHEL Engineer in Charge.

9.3.3

Before starting work under any contract, the contractor must ensure that a job specific safety procedures/field practices as required over and above the safety permit conditions are prepared and followed .He should also ensure that all supervisors and workers involved understand and follow this procedures /field practices.

9.3.4 Contractor must ensure that in his work site appropriate display boards are put displaying signs for site safety, potential hazards and precautions required.

9.4.0 **TRAINING & AWARENESS**

9.4.1 Contractor shall deploy experienced supervisors and other manpower who are well conversant with the safety and environment regulations of the Project. The electricians to be deployed on the job should have wireman license.

9.4.2 All Supervisors & Workmen of the Contractor shall undergo Fire safety training/ demonstration whenever arranged by BHEL with the help of either Customer's Fire and Safety department or outside faculty so as to acquire knowledge of fire prevention and also to be able to make use of appropriate fire extinguishers.

9.4.3 Contractor must familiarize himself from BHEL Engineer in Charge about all known potential fire, explosion or toxic release hazards related to the contract. He in turn will ensure that same information has been passed to the supervisors and workmen

9.4.4 Contractor must ensure that all his supervisors are properly trained and each employee has received and understood from his supervisor necessary training and briefing about the safety requirement. Necessary document as a means to verify that employees have understood the training is to be maintained.

9.4.5 The contractor supervisors shall also give a small safety briefing to all the workmen under his charge before undertaking any new work and specially understand the safety requirements that are mandatory

9.5.0 **REPORTING**

9.5.1 The contractor shall submit report of all accidents, fires and property damage, dangerous occurrences to the authorised BHEL official immediately after such occurrence but in any case not later than twelve hours of the occurrence. Such report shall be furnished in the manner prescribed by BHEL and also to meet statutory requirement.

9.5.2 Any injury sustained by any of the contractor's employees within the Project premises must be reported to BHEL supervisor and FIRST AID should be immediately administered. The Contractor shall be responsible for keeping and maintaining proper records of Accidents to his personnel.

9.5.3 Contractor must arrange to immediately investigate, properly document and report any injury, accident or near miss involving any of his employees and take appropriate follow up action. He must furnish within 12 hours of the incident a written report to BHEL Engineer in charge and the Safety Section.

9.5.4 According to the Factory Act and the Employees state Insurance Act & regulation, any person sustaining any injury within the project premises and absenting himself from work for more than 46 hours, his accident report has to be sent to the respective Government Authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.5 In addition, contractor shall submit periodic reports on safety to the authorised BHEL official from time to time as prescribed.

9.5.6 Before commencing the work, the contractor shall appoint/nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

9.6 **AUDIT REVIEW AND INSPECTION**

9.6.1 BHEL shall conduct audit on the contractor performance and compliance with the project specific requirements of the Environment and Occupational Health & Safety Management systems. The programme of audit shall cover all activities under the contract but will focus particularly on high-risk activities. The Construction Manager shall decide the schedule of audit. The audit findings shall be communicated to the contractors and necessary remedial action as advised by BHEL Engineers shall be under taken within the stipulated time.

9.6.2 Inspections shall be carried out regularly by the contractors and by BHEL Engineers on activities, facilities, equipment, documentation, to cover the following aspects.

- Compliance with procedures and systems
- Availability, condition and use of PPEs

- Condition of maintenance tools, equipments, facilities
- Availability of fire fighting equipments and its condition
- Use of fire fighting equipments and first aid kit
- Awareness of occupational health hazard
- Awareness of safe working practices
- Presence of quality supervision
- Housekeeping

The Safety Co-ordinator shall visit and inspect work sites daily. All unsafe acts, unsafe conditions that have imminent potential for causing harm/injury/damage will be immediately corrected. He shall maintain a daily logbook giving details of unsafe acts or conditions observed and the corrective action taken and recommendations for preventing recurrence. Adequacy of corrective actions will be verified

The contractor shall take remedial measures as per the findings of each inspection.

Besides the above, the contractor shall be required to carry out the following inspections.

SN	Equipment	Scope of inspection	Inspection by	Schedule
1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire Extinguishers	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/tacles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.7 **NON COMPLIANCE**: -

9.7.1 NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND THE BHEL HAS RIGHT TO IMPOSE FINES ON THE CONTRACTOR AS UNDER **for every instance of violation noticed** :

SN	Violation of Safety Norms	Fine (in Rs)
01	Not Wearing Safety Helmet	50/-
02.	Not wearing Safety Belt	100/-
03.	Grinding Without Goggles	50/-
04.	Not using 24 V Supply For Internal Work	500/-
05.	Electrical Plugs Not used for hand Machine	100/-
06.	Not Slinging property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&P	500/-
14.	Accident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
15.	Fatal Accident/Accidents Resulting in total loss in Earning	1,00,000/-

	Capacity	per victim

Any other non-conformity noticed not listed above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills of the contractor. The amount collected above will be utilised for giving award to the employees who could avoid accident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.

9.8 **CITATION:**-If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognise the safety performance of the contractor may be considered by BHEL after completion of the job

9.9 **Memorandum of Understanding**

After Award Of Work, Contractors Are Required To Enter Into A Memorandum Of Understanding As Given Below:

Article II. Memorandum of Understanding

BHEL, PSWR is committed to Health, Safety and Environment Policy (EHS Policy) as given in the booklet titled " Safe Working Practices" issued to all contractors.

M/s _____ do hereby also commit to the same EHS Policy while executing the Contract Number _____

M/s _____ shall ensure that safe work practices not limited to the above booklet are followed by all construction workers and supervisors. Spirit and content therein shall be reached to all workers and supervisors for compliance.

BHEL will be carrying out EHS audits twice a year and M/s _____ shall ensure to close any non-conformity observed/reported within fifteen days.

Signed by authorised representative of M/s---------- ----------

Name :

Place & Date:

9.10 Comprehensive list of National Standards for reference and use wherever applicable in the execution of Civil, Erection and Commissioning Contracts.

IS No.	YEAR	Amd upto	DESCRIPTION
IS 10204	1982		PORTABLE FIRE EXTINGUISHERS MECHANICAL FOAM TYPE
IS 10245	1994		SPECIFICATION FOR BREATHING APPARATUS
IS 10291	1982		SAFETY CODE FOR DRESS DRIVERS IN CIVIL

IS No.	YEAR	Amd upto	DESCRIPTION
			ENGINEERING WORKS
IS 10658	1983		HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHERS (TROLLEY MOUNTED)
IS 10662	1992		COLOUR TELEVISION
IS 10667	1983		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF FOOT AND LEG
IS 11037	1984		ELECTRONIC FAN REGULATORS
IS 11057	1984		INDUSTRIAL SAFETY NETS
IS 11451	1998		RECOMMENDATION FOR SAFETY AND HEALTH REQUIREMENT RELATING TO OCCUPATION EXPOSURE TO ASBESTOS
IS 1169	1967		PEDESTAL FANS
IS 1179	1967		SPECIFICATION FOR EQUIPMENT FOR EYE AND FACE PROTECTION DURING WELDING
IS 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR METAL FIRES
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A SEWARAGE SYSTEM
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING ADDITIONAL CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS- DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS

IS No.	YEAR	Amd upto	DESCRIPTION
			(GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION
IS 4014	1967		CODE OF PRACTICE FOR STEEL TUBULAR SCAFFOLDING
IS 4081	1986		SAFETY CODE FOR BLASTING AND RELATED DRILLING OPERATIONS
IS 4082	1977	1996	STACKING AND STORAGE OF CONSTRUCTION MATERIALS AND COMPONENTS AT SITE
IS 4130	1991		DEMOLITION OF BUILDINGS - CODE OF SAFETY PART 1 TO 2
IS 4138	1977		SAFETY CODE FOR WORKING IN COMPRESSED AIR (FIRST REVISION)

IS No.	YEAR	Amd upto	DESCRIPTION
IS 4155	1966		GLOSSARY OF TERMS RELATING TO CHEMICAL AND RADIATION HAZARDS AND HAZARDOUS CHEMICALS
IS 4209	1967		CODE OF SAFETY FOR CHEMICAL LABORATORY
IS 4250	1980		FOOD MIXERS
IS 4262	1967		CODE OF SAFETY FOR SULFURIC ACID
IS 4756	1978		SAFETY CODE FOR TUNNELING WORK
IS 4912	1978		SAFETY REQUIREMENTSFOR FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS
IS 5121	1969		SAFETY CODE FOR PILING AND OTHER DEEP FOUNDATIONS
IS 5182	1969	1982	METHODS FOR MEASUREMENT OF AIR POLLUTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY PROCEDURES AND PRACTICE IN ELECTRICAL WORK PART I AND II
IS 555	1979		TABLE FANS
IS 5557	1995		INDUSTRIAL AND SAFETY LINED RUBBER BOOTS (SECOND REVISION)
IS 5916	1970		SAFETY CODE FOR CONSTRUCTION INVOLVING USE OF HOR BITUMINOUS MATERIALS
IS 5983	1980		SPECIFICATION FOR EYE PROTECTORS - FIRST REVISION
IS 6234	1986		PORTABLE FIRE EXTINGUISHERS WATER TYPE (STORED PRESSURE)
IS 692	1994		CRITERIA FOR SAFETY AND DESIGN OF STRUCTURES SUBJECTED TO UNDERGROUND BLASTS
IS 6994	1973		SPECIFICATION FOR SAFETY GLOVES
IS 7155	1986		CODE OF RECOMMENDED PRACTICE FOR CONVEYOR SAFETY (PART 1 TO 8)
IS 7205	1974		SAFETY CODE FOR ERECTION OF STRUCTURAL STEEL WORK
IS 7293	1974		SAFETY CODE FOR WORKING WITH CONSTRUCTION MACHINERY
IS 7323	1994		GUIDELINES FOR OPERATIONS OF RESERVOIRS
IS 7812	1975		CODE OF SAFETY FOR MERCURY
IS 7969	1975		SAFETY CODE FOR HANDLING AND STORAGE OF BUILDING MATERIALS
IS 8089	1976		CODE OF SAFE PRACTICE FOR LAYOUT OF OUTSIDE FACILITIES IN AN INDUSTRIAL PLANT
IS 8091	1976		CODE OF PRACTICE FOR INDUSTRIAL PLANT LAYOUT
IS 8095	1976		ACCIDENTS PREVENTION TAGS
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY

IS No.	YEAR	Amd upto	DESCRIPTION
			EQUIPMENT FOR EYE, FACE AND EAR PROTECTION
IS 875	1987		STRUCTURAL SAFETY OF BUILDING: LOADING STANDARD PART 1 TO 5
IS 8807	1978		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS
IS 8978	1985		INSTANTANEOUS WATER HEATERS
IS 8989	1978		SAFETY CODE FOR ERECTION OF CONCRETE FRAMED STRUCTURES
IS 940	1989		PORTABLE FIRE EXTINGUISHERS WATER TYPE (GAS CARTRIDGE)
IS 9457	1980		SAFETY COLOURS AND SIGNS
IS 9679	1980		CODE OF SAFETY FOR WORK ENVIRONMENTAL MONITORING
IS 9706	1997		CODE OF PRACTICE FOR THE CONSTRUCTION OF AERIAL RPEWAYS FOR THE TRANSPORTATION OF MATERIAL
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10

SPECIAL CONDITIONS OF CONTRACT

10.0 DRAWINGS AND DOCUMENTS

10.1
THE DETAILED DRAWINGS, SPECIFICATIONS AVAILABLE WITH BHEL ENGINEERS WILL ALSO FORM PART OF THIS TENDER SPECIFICATION. REVISION OF DRAWINGS/DOCUMENTS MAY TAKE PLACE DUE TO VARIOUS CONSIDERATIONS AS IS NORMAL IN SUCH LARGE PROJECT. WORK WILL HAVE TO BE CARRIED OUT AS PER REVISED DRAWINGS/ DOCUMENTS. THESE DOCUMENTS WILL BE MADE AVAILABLE TO THE CONTRACTOR DURING EXECUTION OF WORK AT SITE.

10.2
ONE SET OF NECESSARY DRAWINGS/DOCUMENTS TO CARRY OUT THE ERECTION WORK WILL BE FURNISHED TO THE CONTRACTOR BY BHEL ON LOAN THAT SHALL BE RETURNED TO BHEL AFTER COMPLETION OF THE WORK. CONTRACTOR'S PERSONNEL SHALL TAKE CARE OF THESE DOCUMENTS GIVEN TO THEM.

10.3
THE DATA FURNISHED IN VARIOUS SECTIONS AND APPENDICES AND THE DRAWINGS ENCLOSED WITH THIS TENDER SPECIFICATION DESCRIBE THE EQUIPMENT TO BE INSTALLED, TESTED AND COMMISSIONED UNDER THIS SPECIFICATION, BRIEFLY. HOWEVER, THE CHANGES IN THE DESIGN AND IN THE QUANTITY MAY BE EXPECTED TO OCCUR AS IS USUAL IN ANY SUCH LARGE SCALE OF WORKS.

10.4
IF ANY ERROR OR AMBIGUITY IS DISCOVERED IN THE SPECIFICATION/INFORMATION CONTAINED IN THE DOCUMENTS/DRAWINGS AND TENDER, THE CONTRACTOR SHALL FORTHWITH BRING THE SAME TO THE NOTICE OF BHEL BEFORE SUBMISSION OF OFFER.

10.5
IN CASE AN AMBIGUITY IS DETECTED AFTER AWARD OF WORK, THE SAME MUST BE BROUGHT TO THE NOTICE OF BHEL BEFORE COMMENCEMENT OF THE WORK/ACTIVITY. BHEL'S INTERPRETATION IN SUCH CASES WILL BE FINAL AND BINDING ON THE CONTRACTOR.

10.6
IN CASE OF ANY CONFLICT BETWEEN GENERAL INSTRUCTIONS TO TENDERERS, GENERAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 1 & 2 RESPECTIVELY AND SPECIAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 4 TO 15 AND APPENDICES, PROVISIONS CONTAINED IN SPECIAL CONDITIONS OF CONTRACT IN SECTIONS 4 TO 15 AND APPENDICES SHALL PREVAIL.

10.7
IN CASE OF DISCREPANCY BETWEEN QUOTED ITEM RATE AND CORRESPONDING AMOUNT IN THE RATE SCHEDULE, THE **QUOTED ITEM RATES SHALL BE RECKONED AS CORRECT AND AMOUNT RECALCULATED**. QUOTED ITEM RATES SHALL ALSO PREVAIL FOR ARRIVING AT THE TOTAL PRICE QUOTED FOR OFFER EVALUATION.

10.8
BANK GUARANTEES TO BE FURNISHED BY THE CONTRACTOR TOWARDS SECURITY DEPOSIT AND PERFORMANCE GUARANTEE (LAST 5% PAYMENT AGAINST WORKMANSHIP WARRANTY/DEFECT LIABILITY) SHALL HAVE A CLAIM PERIOD OF SIX MONTHS OVER AND ABOVE THE VALIDITY PERIOD REQUIRED FOR THE CASE.

SECTION-11

SPECIAL CONDITIONS OF CONTRACT

TIME SCHEDULE, MOBILIZATION, PROGRESS MONITORING, OVER RUN, VARIATION ETC.

11.1 MOBILIZATION, TIME SCHEDULE, CONTRACT PERIOD AND GRACE PERIOD

11.1.1 INITIAL MOBILIZATION FOR MATERIAL HANDLING AND MM SERVICES

CONTRACTOR SHALL MOBILIZE NECESSARY RESOURCES WITHIN SHORTEST POSSIBLE TIME OF ISSUE OF FAX LETTER OF INTENT TO COMMENCE THE MATERIAL HANDLING AND VARIOUS MATERIALS MANAGEMENT SERVICES. SUCH RESOURCES SHALL BE PROGRESSIVELY AUGMENTED TO MATCH THE FLOW OF MATERIALS FROM BHEL MANUFACTURING UNITS.

MATERIAL SUPPLY IS ALREADY COMMENCED FOR BOILER COMPONENTS.

11.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.

THE ACTIVITIES FOR ERECTION, TESTING ETC. SHALL BE STARTED AS PER DIRECTIONS OF CONSTRUCTION MANAGER OF BHEL. CONTRACTOR SHALL MOBILISE FURTHER RESOURCES (IN ADDITION TO THOSE REQUIRED FOR ACTIVITIES UNDER CLAUSE No. 11.1.1) AS PER REQUIREMENT TO COMMENCE THE WORK OF ERECTION, TESTING ETC. OF BOILER AND AUXILIARIES AND PROGRESSIVELY AUGMENT THE RESOURCES TO MATCH SCHEDULE OF THE PROJECT.

11.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

ERECTION/PLACEMENT ON IT'S DESIGNATED FOUNDATION/LOCATION, OF THE FIRST MAJOR PERMANENT EQUIPMENT/COMPONENT/COLUMN COVERED IN THE SCOPE OF THESE SPECIFICATIONS SHALL BE RECOGNIZED AS "START OF CONTRACT PERIOD". SMALLER ITEMS LIKE PACKER PLATES, SHIMS, ANCHORS, INSERTS ETC. WILL NOT BE CONSIDERED AS START OF CONTRACT PERIOD.

THE CONTRACTOR HAS TO SUBSEQUENTLY AUGMENT HIS RESOURCES IN SUCH A MANNER THAT FOLLOWING MAJOR MILESTONES OF ERECTION & COMMISSION ARE ACHIEVED ON SPECIFIED SCHEDULES:

SN	MAJOR MILESTONE	COMPLETION
01	BOILER DRUM LIFTING	30.01.2008
02	BOILER HYDRAULIC TEST (DRAINABLE)	30.08.2008
03	BOILER HYDRAULIC TEST (NON-DRAINABLE)	30.11.2008
04	BOILER LIGHT UP & ALKALI BOIL OUT	30.12.2008
05	ACID CLEANING COMPLETION (EDTA)	30.01.2009
06	STEAM BLOWING COMPLETION & SAFETY VALVE FLOATING	30.03.2009
07	SYNCHRONIZATION WITH COAL FIRING	28.04.2009
08	COAL FIRING	30.05.2009

SN	MAJOR MILESTONE	COMPLETION
09	**TRIAL OPERATION COMPLETION**	**30.06.2009**
10	STABILIZATION OF THE PLANT OPERATION AND COMPLETION OF ALL FACILITIES	30.11.2009

IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ANY OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER/PROJECT SCHEDULE REQUIREMENTS, CONTRACTOR SHALL ARRANGE & AUGMENT ALL NECESSARY RESOURCES FROM TIME TO TIME ON THE INSTRUCTIONS OF BHEL.

11.1.2 **CONTRACT PERIOD**

THE CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK UNDER SCOPE SHALL BE **25 (TWENTY FIVE) MONTHS** FROM THE "START OF CONTRACT PERIOD" AS SPECIFIED EARLIER.

THE PERIOD FROM THE COMMENCEMENT OF MATERIAL HANDLING & MANAGEMENT AND/OR PREPARATORY WORK FOR ERECTION TILL THE ACTURAL "START OF CONTRACT PERIOD" SHALL NOT BE RECKONED FOR THE ABOVE PURPOSE.

11.1.3 **GRACE PERIOD**

GRACE PERIOD OF 5 (FIVE) MONTHS BEYOND THE CONTRACT PERIOD OF 25 (TWENTY FIVE) MONTHS MAY BE PROVIDED FOR THIS CONTRACT AT THE DISCRETION OF BHEL.

11.1.4 CONSEQUENCE OF DELAY

IT MAY BE NOTED THAT IN THE EVENT DELAY IN COMPLETION IS ATTRIBUTABLE TO THE CONTRACTOR AND LEADS TO IMPOSITION OF LIQUIDATED DAMAGES BY BHEL'S CLIENT, BHEL WILL IMPOSE LD ON THE CONTRACTOR AS PER GCC.

11.2 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.2.1 PROGRESS MONITORING

PROGRESS WILL BE REVIEWED PERIODICALLY (DAILY/WEEKLY/MONTHLY) INCLUDING MONTH END REVIEW VIS-A-VIS THE PLANS DRAWN AS ABOVE. THE CONTRACTOR SHALL SUBMIT PERIODICAL PROGRESS REPORTS AND OTHER REPORTS/INFORMATION INCLUDING MANPOWER, CONSUMABLES ETC AS DESIRED BY BHEL.

11.2.2 ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

THE ONUS PROBANDI THAT THE CAUSES LEADING TO EXTENSION OF THE CONTRACT PERIOD IS NOT DUE TO ANY REASONS ATTRIBUTABLE TO THE CONTRACTOR IS ON HIM (THE CONTRACTOR). REVIEW OF THE PERFORMANCE AS STATED VIDE CL. 11.2.1 ABOVE WILL BE MADE CONSIDERING THE AVAILABILITY OF COMPONENTS TO BE ERECTED AND OTHER INPUTS / CONSTRAINTS OVER WHICH THE CONTRACTOR HAS NO CONTROL. THE PROGRAMME WILL BE REVIEWED AREA-WISE AND THE FOLLOWING FACTS WILL BE RECORDED IN CASE OF SHORTFALL AT THE END OF EVERY MONTH:

A) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF FRONTS.

B) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF MATERIALS.

C) ERECTION/COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF TOOLS AND PLANTS, MANPOWER AND CONSUMABLES BY THE CONTRACTOR OR ANY OTHER REASON ATTRIBUTABLE TO THE CONTRACTOR.

D) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED DUE TO ANY OTHER REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR.

11.2.3 CONTRACT EXTENSION

IF THE COMPLETION OF WORK AS DETAILED IN THESE SPECIFICATION GETS DELAYED BEYOND THE END OF CONTRACT PERIOD AND GRACE PERIOD THEN DEPENDING ON THE BALANCE WORK LEFT OUT, BHEL AT ITS DISCRETION MAY EXTEND THE CONTRACT.

11.2.4
A JOINT PROGRAMME SHALL BE DRAWN FOR THE WORK TO BE COMPLETED DURING THE EXTENDED CONTRACT PERIOD. REVIEW OF THE PROGRAM AND RECORD OF SHORTFALL AS DESCRIBE VIDE CLAUSE NO. 11.2.2 SHALL BE DONE DURING THE EXTENDED PERIOD. THE OVER RUN CHARGES WILL BE PAID IN PROPORTION TO THE ACHIEVEMENT OF THE RESPECTIVE MONTH VIS-À-VIS THE PLAN FOR THE MONTH (FOR ASSESSING THE PERFORMANCE, THE AGREED PLAN SHALL BE REDUCED BY SHORTFALL ATTRIBUTABLE TO THE BHEL). BHEL MAY DISALLOW CONTRACTOR'S CLAIM FOR OVER RUN CHARGES IF THE MONTHLY PROGRAMME AS MENTIONED IN THESE SPECIFICATIONS ARE NOT MADE BY HIM.

11.2.5
THE PART OF EXTENSION ATTRIBUTABLE TO THE CONTRACTOR, IF ANY, IN TOTAL CONTRACT EXTENSION SHALL BE EXHAUSTED FIRST i.e., IMMEDIATELY AFTER END OF GRACE PERIOD. THIS SHALL BE FOLLOWED BY THE EXTENSION ON ACCOUNT OF FORCE MAJEURE CONDITIONS, IF ANY, AND LASTLY ON ACCOUNT OF BHEL.

11.2.6 OVERRUN COMPENSATION

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT AND GRACE PERIOD FOR ANY REASON OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVERRUN CHARGES AT THE RATE OF RS.1,00,000/- (RUPEES ONE LAKH ONLY) PER MONTH. OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. **NO OVERRUN COMPENSATION SHALL BE PAYABLE FOR THE EXTENSION OF CONTRACT ON ACCOUNT OF MATERIAL HANDLING/MATERIAL MANAGEMENT, REASONS OF DELAY OF ERECTION & COMMNG. WORKS ATTRIBUTABLE TO CONTRACTOR AND/OR FORCE MAJEURE CONDITIONS**. OVERRUN COMPENSATION FOR ELIGIBLE PERIOD SHALL BE IN PROPORTION TO THE PROGRESS ACHIEVED AGAINST THE PLAN FOR RESPECTIVE PERIOD.

11.3 PRICE VARIATION

AGREED ITEM RATES OR RATE SCHEDULE SHALL REMAIN FIRM THROUGHOUT THE CONTRACT PERIOD AND EXTENSIONS THEREOF. NO PRICE VARIATION/ADJUSTMENT SHALL BE APPLICABLE FOR THIS CONTRACT.

11.4 CONTRACT VARIATIONS

11.4.1 VARIATION IN WEIGHT/QUANTITIES

WEIGHT OF VARIOUS EQUIPMENTS, QUANTITIES OF VARIOUS ITEMS OF WORK COVERED UNDER THESE SPECIFICATIONS AND INDICATED IN RELEVANT APPENDICES FOR ERECTION & COMMISSIOING AND MATERIAL HANDLING/MATERIAL MANAGEMENT SERVICES ARE LIKELY TO VARY. FOR ANY UPWARD OR DOWNWARD VARIATION IN THE QUANTITIES, THE RATES ACCEPTED SHALL BE APPLICABLE WITHOUT ANY VARIATION. PAYMENT WILL BE MADE BY BHEL FOR THE ACTUAL EXECUTED QUANTITY OF RESPECTIVE ITEM AS CERTIFIED BY BHEL ENGINEERS.

FOR THE PURPOSE OF PAYMENT FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES, GROSS WEIGHT HANDLED INCLUDING WEIGHT OF PACKING WILL BE TAKEN INTO ACCOUNT. GENERALLY WEIGHT INDICATED IN LR/RR/LWB WILL BE TAKEN FOR THIS PURPOSE. IN CASE WEIGHT INDICATED ON LWB IS 'FTL' OR 'FIXED', THE WEIGHT SHALL BE ASSESSED BY BHEL IN ACCORDANCE TO RELEVANT STANDARDS AND PAID ACCORDINGLY WHICH SHALL BE FINAL/BINDING ON CONTRACTOR.

11.4.2 VARIATION IN SITE WELD JOINT QUANTITIES

THE INDICATIVE QUANTITIES OF SITE WELD JOINTS ARE FURNISHED IN RELEVANT APPENDIX. HOWEVER, FOR ANY VARIATION IN THESE QUANTITIES, NO ADDITIONAL PAYMENT/ COMPENSATION IS ENVISAGED IN THIS CONTRACT.

11.5 RECIEPT OF MATERIAL TRANSPORTED BY RAIL

THE RATE SCHEDULE INVITED IN OFFER ARE FOR UNLOADING, STACKING VARIFICATION ETC OF MATERIALS RECEIVED TRANSPORTED BY ROAD, AS MOST OF THE MATERIALS ARE EXPECTED TO BE RECEIVED BY ROAD ON DOOR DELIVERY BASIS. HOWEVER, AT ANY STAGE, IN CASE RAILS RECEIVE SOME MATERIALS, ALL THE CONDITIONS SPECIFIED IN THESE SPECIFICATIONS SHALL BE APPLICABLE MUTATIS-MUTANDIS ON THE CONTRACTOR. THE WORK WILL INVOLVE RECIEPT, UNLOADING AT RAILWAY SIDING, VERIFICATION, TRANSPORTATION TO STORAGE YARD/ STORES/SITE, UNLOADING, VERIFICATION AND STAKING ETC. FOR PAYMENT IN RESPECT SUCH CONSIGNMENTS THE APPLICABLE RATE WILL BE 150% (1 ½ TIMES) OF ACCEPTED UNIT RATE APPLICABLE FOR HANDLING OF MATERIALS RECEIVED BY ROAD **(i.e. ITEM NO. A.1 OF RATE SCHEDULE).** NO OTHER PAYMENT IS ENVISAGED FOR SUCH RECEIPTS. THE TERMS OF PAYMENT DEFINED UNDER SECTION-12 SHALL ALSO BE APPLICABLE FOR RAIL RECEIPTS AS ABOVE.

11.6 INTREST BEARING ADVANCE

INTEREST BEARING (BANK RATE PLUS 1%) ADVANCE LIMITED TO 5% OF THE AWARD VALUE MAY BE PAID BY BHEL AT ITS DISCRETION AGAINST SPECIFIC REQUEST OF CONTRACTOR AND AFTER RECEIPT & ACCEPTANCE OF BANK GUARANTEE FOR THE AMOUNT OF ADVANCE SOUGHT. THIS BANK GUARANTEE SHALL BE KEPT VALID FOR SUFFICIENT PERIOD, WITH TIMELY RENEWALS IF NEED BE, TILL THE ENTIRE AMOUNT INCLUDING INTEREST THEREOF IS RECOVERED. RECOVERY OF THIS AMOUNT WILL BE MADE @ 10% OF THE ADMITTED RUNNING BILL AMOUNT FROM THE FIRST APPLICABLE RUNNING BILL ONWARDS.

11.7 DEFINITION OF WORK COMPLETION

THE CONTRACTOR'S SCOPE OF WORK UNDER THESE SPECIFICATIONS WILL BE DEEMED TO HAVE BEEN COMPLETED IN ALL RESPECT, ONLY WHEN ALL THE ACTIVITIES ARE COMPLETED SATISFACTORILY AND SO CERTIFIED BY BHEL SITE IN CHARGE. THE DECISION OF BHEL IN THIS REGARD SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

SECTION-12

SPECIAL CONDITIONS OF CONTRACT

12.0 TERMS OF PAYMENT

12.0.1
THE CONTRACTOR SHALL SUBMIT HIS MONTHLY ON ACCOUNT BILLS WITH ALL THE DETAILS REQUIRED BY BHEL ON SPECIFIED DATE EVERY MONTH COVERING PROGRESS OF WORK IN ALL RESPECTS AND AREAS FROM THE 25TH OF PREVIOUS CALENDAR MONTH TO 24TH OF THE CURRENT MONTH.

12.0.2
CLAUSE 2.6 OF GENERAL CONDITIONS OF CONTRACT SHALL BE REFERRED TO AS REGARDS MODE OF PAYMENT, AND MEASUREMENT OF THE WORK COMPLETED.

12.0.3
RELEASE OF PAYMENT IN EACH RUNNING BILL WILL BE RESTRICTED TO 95% OF THE VALUE OF WORK ADMITTED, AS PER THE PERCENTAGE BREAK-UP FOR THE STAGE OF WORK COMPLETION STIPULATED VIDE CLAUSES HEREINAFTER. THE 5% THUS REMAINING SHALL BE TREATED AS AMOUNT PAYABLE BUT NOT DUE AND SHALL BE ON ACCOUNT OF WORKMANSHIP GUARANTEE OF WORK EXECUTED. THE SAME IS TO BE RELEASED AFTER COMPLETION OF THE GUARANTEE PERIOD OF 12 MONTHS FROM THE DATE OF COMPLETION OF ENTIRE WORK AS CERTIFIED BY BHEL ENGINEER. HOWEVER THIS AMOUNT MAY BE RELEASED ON SUBMISSION OF BANK GUARANTEE OF EQUAL AMOUNT AND TENURE IN PRESCRIBED FORMAT AND THE BG SHALL BE KEPT VALID TILL COMPLETION OF SUCH GUARANTEE PERIOD AND AN ADDITIONAL SIX MONTHS CLAIM PERIOD.

12.0.4
THE PAYMENT FOR RUNNING BILLS WILL NORMALLY BE RELEASED WITHIN AROUND 30 DAYS OF SUBMISSION OF RUNNING BILL WITH MEASUREMNT SHEETS. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENT FOR MAKING PAYMENT OF IMPENDING LABOUR WAGES AND OTHER DUES IN THE MEANWHILE.

12.0.5
BHEL WILL RELEASE PAYMENT THROUGH ELECTRONIC FUND TRANSFER (EFT)/RTGS. IN ORDER TO IMPLEMENT THIS SYSTEM, THE FOLLOWING DETAILS ARE TO BE FURNISHED BY THE CONTRACTOR PERTAINING TO HIS BANK ACCOUNTS WHERE PROCEEDS WILL BE TRANSFERRED THROUGH BHEL'S BANKER:

1. NAME OF THE COMPANY
2. NAME OF BANK
3. NAME OF BANK BRANCH
4. CITY/PLACE
5. ACCOUNT NUMBER
6. ACCOUNT TYPE
7. IFSC CODE OF THE BANK BRANCH
8. MICR CODE OF THE BANK BRANCH

BHEL MAY ALSO CHOOSE TO RELEASE PAYMENT BY OTHER ALTERNATIVE MODES AS SUITABLE.

12.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

12.1.1 E &C OF BOILER AND AUXILIARIES , PIPING, FABRICATED STRUCTURES ETC (REFER SECTION-"C" OF RATE SCHEDULE.

100% OF ITEM RATE FOR VARIOUS ITEMS OF WORK UNDER THESE SPECIFICATIONS WILL BE RELEASED, BASED ON CERTIFIED COMPLETION BY BHEL ENGINEER, AS PRO-RATA PROGRESSIVE PAYMENT AS PER THE STAGE BREAK UP GIVEN HEREAFTER:
12.1.1.1

SL. NO.	PART OF THE ACTIVITY COMPLETED	PERCENTAGE OF ACCEPTED ITEM RATES				
		NON-PRESSURE PARTS.	STRUC-TURES	PRESSURE PARTS	ROTATING M/c	ELECTROSTATIC PRECIPITATOR
A	TRANSPORT, & ERECTION / PLACEMENT	40	40	40	40	40
B	ALIGNMENT, BOLTING, GROUTING & WELDING	45	45	40	45	45
C	GAS TIGHTNESS TEST / KEROSENE LEAK TEST / LPI TEST ETC	5	---	---	---	5
D	NDE AND HEAT TREATMENT	---	5	10	---	--
E	TRIAL RUN OF ROT. M/C	---	---	---	5	--
F	ON COMPLETION OF DRUM LIFTING	---	4	---	---	--
G	ON COMPLETION OF HYDRAULIC TEST OF BOILER (DRAINABLE)	---	2	3	---	--
H	ON COMPLETION OF HYDRAULIC TEST OF BOILER (NON-DRAINABLE)	---	---	3	---	--
I	ON COMPLETION OF BOILER LIGHT UP AND ABO	4	2	2	4	4
J	ON COMPLETION OF SVF & STEAM	1	1	1	1	

SL. NO.	PART OF THE ACTIVITY COMPLETED	PERCENTAGE OF ACCEPTED ITEM RATES				
		NON-PRESSURE PARTS.	STRUC-TURES	PRESSURE PARTS	ROTATING M/c	ELECTROSTATIC PRECIPITATOR
	BLOWING					--
K	COAL FIRING	4	---	---	4	5
L	TRIAL OPERATION	1	1	1	1	1
	TOTAL	100%	100%	100%	100%	100 %

12.1.1.2 SOOT BLOWING STEAM PIPING, BOILER TRIM AND INTEGRAL PIPING, FUEL OIL PIPING AND CRITICAL PIPING

(A) 25% OF THE CONTRACT RATE ON PRORATA BASIS AFTER PLACEMENT IS COMPLETED.

(B) 30% OF THE CONTRACT RATE ON PRORATA BASIS AFTER ALIGNMENT & JOINT FIT-UP IS COMPLETED.

(C) 25% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF WELDING

(D) 10% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF NDE & POST WELD HEAT TREATMENT, IF ANY.

(E) 5% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF HYDRAULIC TEST

(F) 3% OF THE CONTRACT RATE ON PRORATA BASIS AFTER FLOATING OF LINE ON PERMANENT SUPPORTS AND REMOVAL OF TEMPORARY SUPPORT

(G) 2% OF THE CONTRACT RATE ON PRORATA BASIS AFTER FINAL ADJUSTMENT OF SUPPORTS FOR COLD AND HOT VALUES FOR BOILER TRIM, INTEGRAL PIPING AND CRITICAL PIPING.

12.1.1.3 RADIOGRAPHY TEST (Item No. C.8 of Rate Schedule)

100% OF THE CONTRACT RATE ON PRORATA BASIS ON ACCEPTANCE OF THE SAME. IN THE CASE OF SUBSTUTION OF 'RT' WITH ULTRASONIC TEST, THE RATES WILL BE LIMITED TO THAT OF RADIGRAPHY.

12.1.1.4 FABRICATION OF RACK STRUCTURE AND EMBEDMENTS

100% PAYMENT OF ITEM RATE ON PRO-RATA BASIS ON ACCEPTANCE OF THE FABRICATED ITEM AND RELEASE FOR ERECTION/ HANDING OVER. HOWEVER, IN CASE RECONCILIATION/ ACCOUNTING OF THE MATERIALS TILL THAT STAGE IS NOT SUBMITTED BY THE CONTRACTOR BHEL ENGINEER AT HIS DISCRETION MAY RETAIN SOME AMOUNT, NOT EXCEEDING 5% OF THE GROSS BILLED AMOUNT ON THIS HEAD IN THAT PARTICULAR MONTH,.

12.1.2 STAGE-WISE BREAK UP FOR PRO-RATA PROGRESSIVE PAYMENT MATERIAL HANDLING (REFER SECTION-"A" OF RATE SCHEDULE)

12.1.2.1 INCOMING MATERIALS **(ITEM NOS. A.1, A.2 AND A.4** OF RATE SCHEDULE)

12.1.2.1.1 UNLOADING & PRELIMINARY VERIFICATION OF MATERIALS

45 % OF AGREED RATES SHALL BE PAID AFTER THE MATERIALS ARE RECEIVED AND UNLOADED AT PROJECT SITE AND VERIFIED (VERIFICATION OF PHYSICAL QUANTITIES AND EXTERNALLY DETECTABLE DAMAGES) WITH REFERENCE TO RR/LWB/PWB SUBJECT TO FURNISHING FOLLOWING INFORMATION AND RECORD ALONG WITH THE BILL.

A) SHORTAGE REPORT/OPEN DELIVERY TAKEN W.R.T. RR/LWB, IF ANY, AND ACCEPTANCE THEREOF BY RAILWAY AUTHORITIES/TRANSPORTERS.

B) PROOF OF THE CLAIM LODGED WITH RAILWAYS/TRANSPORTERS IN RESPECT OF ABOVE SHORTAGE/OPEN DELIVERY.

C) MATERIAL MANAGEMENT FORMS DULY FILLED IN BY CONTRACTOR AND CERTIFIED BY BHEL ENGINEER.

12.1.2.1.2 DETAILED VERIFICATION & STACKING

55 % OF THE AGREED RATES SHALL BE PAID AFTER THE MATERIALS ARE DULY STACKED AND VERIFIED AS PER PACKING SLIP/LOADING ADVICE SLIP BY REPACKING, STACKING ETC. WHEREVER NECESSARY. PAYMENT WILL BE RELEASED ON SUBMISSION OF INFORMATION AS PER MATERIALS MANAGEMENT FORMS BY THE CONTRACTOR IMMEDIATELY AFTER VERIFICATION OF MATERIALS AND CERTIFIED BY BHEL ENGINEERS. SITE ENGINEER WILL PROVIDE THE REQUISITE PROFORMA. NORMALLY THE VERIFICATION OF MATERIAL SHALL BE DONE WITHIN THE TIME FRAME SPECIFIED BY BHEL.

12.1.2.2 **OUTGOING MATERIALS (ITEM NO. A.3 OF RATE SCHEDULE**)

100% OF ACCEPTED RATE WILL BE PAID AFTER PROPER PACKING/BUNDLING OF MATERIALS AS AND WHERE NECESSARY, LOADING ON THE OUTGOING VEHICLE, PREPARATION OF PACKING LIST AND MATERIAL OUTGOING GATE PASS, GETTING THE CONSIGNMENT INSPECTED AND ENDORSED BY THE SECURITY PERSONNEL OF BHEL AS WELL AS THAT OF CUSTOMER, GETTING THE OUT-GOING GATE PASS REGISTERED AT THE 'OUT GATE' OF THE PROJECT.

12.1.3 STAGE-WISE BREAK UP FOR PRO-RATA PROGRESSIVE PAYMENT FOR MATERIALS MANAGEMENT SERVICES (**SECTION-"B" OF RATE SCHEDULE)**

12.1.3.1 FOR SHIFTING/RE-ARRANGING/ RE-STACKING OF MATERIALS **(ITEM SL. NOS. B.2 OF RATE SCHEDULE)**

100% OF THE VALUE OF WORK COMPLETED AND CORESPONDING RECORDS PREPARED IN THE MONTH ON PRO-RATA BASIS.

12.1.3.2 FOR PRESERVATION ACIVITIES, SECRETERIAL SERVICES, SUPERVISORY SERVICES/ STORES ASSISTANCE, OFFICE UPKEEP, MESSANGING SERVICES ETC. (**ITEM NOS. B.1, B.3 AND B.4 OF RATE SCHEDULE)**

100% PAYMENT WILL BE MADE FOR EACH MONTH AS CERTIFIED BY BHEL ENGINEER INCLUSIVE OF SUNDAYS AND HOLIDAYS AS DECLARED BY BHEL FOR A PARTICULAR MONTH.

12.2 MODE OF PAYMENT AND MEASUREMENT OF WORK COMPLETED

CLAUSE 2.6 OF THE GENERAL CONDITIONS OF CONTRACT SHALL BE APPLICABLE.
THE SCOPE OF WORK UNDER THIS CONTRACT SHALL BE TREATED AS COMPLETED ONLY WHEN SO CERTIFIED BY SITE ENGINEER OF BHEL.

12.3 GENERAL

12.3.1
WEIGHT OF PACKERS AND SHIMS WHICH BECOME PERMANENT PART OF EQUIPMENT, BOTH FIGURING IN SHIPPING LIST AND THOSE FABRICATED AT SITE WILL BE PAID FOR ON SHIPPING LIST BASED ACTUAL WEIGHT.

12.3.2
CERTAIN OPTIMIZED ASSEMBLIES / OR MODULES MAY BE MADE, ASSEMBLING PRODUCTS FROM TWO OR MORE DIFFERENT PRODUCT GROUP MAIN ASSEMBLY AND DISPATCHED. PAYMENT FOR ERECTION OF THESE OPTIMIZED ASSEMBLIES / OR MODULES WILL BE REGULATED AS PER THE WEIGHT OF INDIVIDUAL PRODUCT GROUP MAIN ASSEMBLIES CONTRIBUTING TO THE TOTAL WEIGHT OF THE MODULE OR OPTIMIZED ASSEMBLY AT THE QUOTED RATE FOR THE RESPECTIVE PRODUCT GROUP MAIN ASSEMBLIES, IN THE RATE SCHEDULE.

12.3.3
FOR PAYMENT OF TEMPORARY SYSTEM FOR CHEMICAL CLEANING AND STEAM BLOWING OF BOILER AND PIPING THE MEASUREMENT FOR THE PIPING, FITTING, VALVES ETC AND EQUIPMENTS LIKE TANKS, STRUCTURES PROVIDED BY BHEL & NOT FIGURING IN SHIPPING LIST WILL BE BASED ON JOINTLY MEASURED QUANTITY AND CORRESPONDING STANDARD WEIGHTS. PAYMENT WILL BE MADE AT THE RATE APPLICABLE FOR **NON-PRESSURE PARTS** FOR ITEMS. NO PAYMENT WILL BE MADE FOR THE EQUIPMENTS BROUGHT BY THE CONTRACTOR SUCH AS PUMPS ETC AND FOUNDATIONS MADE BY THE CONTRACTOR FOR TEMPORARY SYSTEMS.

12.4 MEASUREMENT OF THE WORK COMPLETED

A) WHERE PAYMENT IS TO BE MADE ON THE BASIS OF WEIGHT, THE WEIGHT PER UNIT GIVEN IN THE BHEL DOCUMENT ONLY SHALL BE TAKEN IN TO CONSIDERATION. IN CASE SUCH AN INFORMATION IS NOT AVAILABLE IN BHEL DOCUMENTS, THEN THE LATEST RELEVANT INDIAN STANDARDS IN THIS REGARD MAY BE APPLIED.

B) SPARES, SURPLUS QUANTITY, ERECTION CONTINGENCY MATERIALS WILL NOT BE PAID FOR UNLESS THE SAME HAS BEEN CONSUMED IN PLACE OF REGULAR ITEM OF MEASURABLE WORK AS PER THE RATE SCHEDULE.

C) WHERE THE PAYMENT IS MADE ON THE BASIS OF ITEM RATE, ACTUAL EXECUTED QUANTITY MEASURED JOINTLY SHALL ONLY BE PAID FOR.

D) IT IS CLARIFIED THAT AS FAR AS WEIGHT CONSTITUTED BY WELDING CONSUMABLES AND OTHER CONSUMABLES SUPPLIED BY BHEL AS WELL AS BY THE CONTRACTOR, SHALL NOT BE CONSIDERED FOR PAYMENT.

E) BHEL ENGINEER'S DECISION REGARDING STAGE OF PAYMENT CORRESPONDING TO PROGRESS OF WORK, CALCULATION OF WEIGHT ETC WILL BE FINAL AND BINDING ON THE CONTRACTOR.

F) NO SEPARATE PAYMENT SHALL BE MADE FOR GROUTING OF EQUIPMENTS, STRUCTURES ETC SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

G) NO SEPARATE PAYMENT WILL BE MADE FOR THE WEIGHT/VOLUME OF LUBRICANT, OILS, CHEMICALS, GASES, WATER, PRESERVATIVES ETC.

H) NO PAYMENT WILL BE MADE FOR THE SPECIAL TOOLS (e.g. FURNACE PLATFOMS – SKY CLIMBERS, PASSENGER ELEVATOR) ETC USED IN VARIOUS ACTIVITIES OF THIS WORK.

I) NO PAYMENT WILL BE MADE FOR WEIGHT OF RUBBER LINING.

SECTION-13
SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

13.1
IF EXTRA WORKS (REQUIRING LESS THAN **100 MAN-HOURS**) FOR MODIFICATION, REWORK, REVAMPING, IN BRIEF, ANY WORK DONE TO CHANGE THE STATE EXISTING TO A STAGE DESIRED AND ALSO FABRICATION, ALL OR ANY, ARE NEEDED DUE TO ANY CHANGE IN OR DEVIATION FROM THE DRAWINGS AND DESIGN OF EQUIPMENT, OPERATION/ MAINTENANCE REQUIREMENTS, MISMATCHING, TRANSIT DAMAGES AND OTHER ALLIED WORKS WHICH ARE NOT VERY SPECIFICALLY INDICATED IN THE DRAWINGS, BUT ARE FOUND ESSENTIAL FOR SATISFACTORY COMPLETION OF THE WORK, ARE DONE, NO EXTRA CHARGES WILL BE PAID. THE TENDERERS ARE REQUESTED TO TAKE THIS ASPECT INTO ACCOUNT AND THE QUOTED RATE SHOULD INCLUDE ALL SUCH CONTINGENCIES.

13.2
IT MAY ALSO BE NOTED THAT IF ANY SUCH SAID EXTRA WORKS ARISE ON ACCOUNT OF THE CONTRACTOR'S FAULT, IRRESPECTIVE OF TIME CONSUMED IN RECTIFICATION OF THE DAMAGE/LOSS, IT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST. UNDER SUCH CIRCUMSTANCES, ANY MATERIAL AND CONSUMABLE REQUIRED FOR THIS PURPOSE WILL ALSO HAVE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST.

13.3
HOWEVER, BHEL MAY CONSIDER FOR PAYMENT AS EXTRA, FOR SUCH OF THOSE WORKS DETAILED IN CLAUSE 13.1 WHICH REQUIRE MORE THAN **100 MAN-HOURS** AND SUCH PAYMENT WILL BE REGULATED BY THE TERMS, CONDITIONS AND STIPULATIONS CONTAINED IN THE CLAUSES 13.4 TO13.8 AND/OR 14.2.1 TO 14.2.10 AS THE CASE MAY BE. IT MAY BE SPECIFICALLY NOTED THAT THE DECISION OF BHEL AS TO WHETHER SUCH PAYMENT IS DUE SHALL BE FINAL AND BINDING ON THE CONTRACTOR. IT MAY ALSO BE NOTED THAT ONLY THOSE WORKS THAT ARE IDENTIFIED AS MAJOR AND WARRANT EXTRA PAYMENT AND CERTIFIED AS SUCH BY THE SITE ENGINEER AND ACCEPTED BY THE DESIGNERS AND/OR COMPETENT AUTHORITY OF BHEL, WILL BE CONSIDERED FOR EXTRA PAYMENT.

13.4
FOR EXTRA WORKS ARISING OUT OF TRANSIT, STORAGE AND ERECTION DAMAGES, PAYMENT, IF FOUND DUE, WILL BE REGULATED BY CLAUSES 14.2.1 TO 14.2.10.

13.5
ALL THE EXTRA WORK SHOULD BE CARRIED OUT BY A SEPARATELY IDENTIFIABLE GANG, WITHOUT AFFECTING ROUTINE ACTIVITIES. DAILY LOG SHEETS IN THE PRO-FORMA PRESCRIBED BY BHEL SHOULD BE MAINTAINED AND SHALL BE SIGNED BY THE CONTRACTOR'S REPRESENTATIVE AND BHEL ENGINEER. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED/ENTERTAINED IN THE ABSENCE OF THE SAID SUPPORTING DOCUMENTS I.E. DAILY LOG SHEETS. IT MAY, HOWEVER BE NOTED THAT SIGNING OF LOG SHEETS BY BHEL ENGINEER DOES NOT MEAN THE ACCEPTANCE OF SUCH WORKS AS EXTRA WORKS. ALL ADMISSIBLE CLAIMS SHALL BE SUBMITTED TO BHEL

13.6
BHEL RETAINS THE RIGHT TO AWARD OR NOT TO AWARD ANY OF THE MAJOR REPAIR/ REWORK/MODIFICATION/RECTIFICATION/FABRICATION WORKS UNDER CLAUSES 13.1 TO 13.6 TO THE CONTRACTOR, AT THEIR DISCRETION WITHOUT ASSIGNING ANY REASON FOR THE SAME.

13.7
EXTRA WORKS THAT ARISE ON ACCOUNT OF CONTRACTOR'S FAULT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST INCLUDING THE SUPPLY OF MATERIAL AND CONSUMABLES

13.8
AFTER ELIGIBILITY OF EXTRA WORKS IS ESTABLISHED AND FINALLY ACCEPTED BY BHEL ENGINEER/DESIGNER, PAYMENT WILL BE RELEASED ON COMPETENT AUTHORITY'S APPROVAL AT THE FOLLOWING RATE.

MAN-DAY RATE FOR ELIGIBLE EXTRA WORKS :

SINGLE AVERAGE MAN-DAY RATE, INCLUDING OVERTIME IF ANY, AND OTHER SITE EXPENSES AND INCIDENTALS, INCLUDING CONSUMABLES, TOOLS AND TACKLES, FOR CARRYING OUT ANY MAJOR REWORK/ REPAIRS/ RECTIFICATION/ MODIFICATION/ FABRICATION OF 8 HOURS AS MAY ARISE DURING THE COURSE OF ERECTION. (REFER CLAUSES 13.1 TO 13.8 AND 14.2.1 TO 14.2.10) UNDER BOILER & AUX. ERECTION & COMMISSIONING WORKS WILL BE **RS. 320/- (RUPEES THREE HUNDRED AND TWENTY ONLY). HOWEVER ABOVE EXTRA WORK MAN DAY RATE SHALL NOT BE APPLICABLE FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES.**

NO PAYMENT WILL BE MADE IF AN ITEM OF WORK LASTS LESS THAN 100 MANHOURS.

SECTION-14
SPECIAL CONDITIONS OF CONTRACT

INSURANCE

14.1
BHEL HAS ARRANGED A COMPREHENSIVE MARINE, STORAGE CUM ERECTION INSURANCE COVER ALL RISKS INCLUDING DAMAGES/LOSS OCCURRING DURING INLAND TRANSPORT. BUT SUCH COVER IS LIMITED TO ONLY THE MATERIALS TRANSPORTED.

14.2
THE CONTRACTOR HAS TO ARRANGE ON HIS OWN, INSURANCE COVER FOR ALL THE T&P AND OTHER CONSTRUCTION EQUIPMENTS DEPLOYED AT SITE. SUCH ASSETS ARE NOT COVERED IN INSURANCE POLICY TAKEN BY BHEL.

14.3
IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE FOR ACCIDENT RISK POLICY/WORKMEN COMPENSATION POLICY FOR THE STAFF AND WORKMEN.

14.4
THE CONTRACTOR HAS TO PROVIDE ASSISTANCE IN LODGING AND REALIZING THE INSURANCE CLAIMS COVERED BY THE MCE INSURANCE POLICY THAT IS TAKEN BY BHEL. SCOPE SHALL INCLUDE RECEIPT INSPECTION (SHORTAGE/DAMAGE/LOSS REPORTING) IMMEDIATELY ON ARRIVAL OF CONSIGNMENT, RECORDING SUCH DAMAGE/LOSS/SHORTAGE INTIMATION ON THE LR/RR/LWB DULY COUNTERSIGNED BY THE DRIVER/TRANSPORTER'S REPRESENTATIVE WHILE ACKNOWLEDGING RECEIPT OF CONSIGNMENT TO THE CONCERNED TRANSPORTER, INTIMATING THE LOSS/DAMAGE/SHORTAGE TO BHEL, PROVIDING ASSISTANCE FOR INSPECTION OF THE REPORTED CONSIGNMENT AT THE TIME OF INSURANCE SURVEY, LIASIONING WITH THE TRANSPORTER AND INSURANCE COMPANY ETC.

14.5
IN CASE OF THEFT / DAMAGE / LOSS OF MATERIALS DUE TO NEGLIGENCE OR FAILURE ATTRIBUTABLE TO THE CONTRACTOR, THE EXPENSES INCURRED ON ACCOUNT OF REPAIR/ REPLACEMENT OF SUCH COMPONENTS INCLUDING BHEL'S OVERHEAD EXPENSES AS APPLICABLE (PRESENTLY @ 30%) IN EXCESS OF THE AMOUNT REALIZED FROM THE UNDERWRITERS SHALL BE RECOVERED FROM THE CONTRACTOR. RECOVERY WILL BE LIMITED TO NORMAL DEDUCTIBLE FRANCHISE (DF) / EXCESS AS PER APPLICABLE INSURANCE TARIFF (TAC) GUIDELINES. HOWEVER, IN CASE SUCH INSURANCE CLAIM IS SUMMARILY REJECTED BY THE UNDERWRITERS DUE TO **WILFUL** DAMAGE/LOSS ON THE PART OF THE CONTRACTOR, THE TOTAL COST OF REPAIR/ REPLACEMENT SHALL BE RECOVERED FROM THE CONTRACTOR.

14.6 INSURANCE BY THE CONTRACTOR AND INDEMNIFICATION OF BHEL

BHEL HAVE TAKEN A THIRD PARTY LIABILITY INSURANCE, INDICATING IN THE PROPOSAL FOR SUCH INSURANCE THAT SUB-CONTRACTORS WILL BE TAKING PART IN THE ERECTION WORK DETAILED IN THIS TENDER. HOWEVER, THE TENDERER HAS TO BEAR ANY EXPENSES/ CONSEQUENCES OVER AND ABOVE THE AMOUNT THAT MAY BE REIMBURSED TO BHEL BY SUCH COVERAGE OF THIRD PARTY LIABILITY INSURANCE TAKEN BY BHEL.

SUCH ADDITIONAL LIABILITY WILL BE TO COVER AND INDEMNIFY BHEL AND ITS CUSTOMER OF ALL LIABILITIES WHICH MAY COME UP AND CAUSE HARM/DAMAGE TO OTHER CONTRACTORS/ CUSTOMER/BHEL PROPERTIES/PERSONNEL OR ALL OR ANYBODY RENDERING SERVICE TO BHEL/CUSTOMER OR IS CONNECTED WITH BHEL / CUSTOMER'S WORK IN ANY MANNER WHATSOEVER. THE TENDERER'S SPECIFIC ATTENTION IS ALSO INVITED TO CLAUSE 2.10 OF GENERAL CONDITIONS OF CONTRACT.

SECTION-15

SPECIAL CONDITION OF CONTRACT

15.0 EARNEST MONEY DEPOSIT & SECURITY DEPOSIT

15.1 EARNEST MONEY DEPOSIT:

EARNEST MONEY DEPOSIT FOR THIS TENDER WILL BE Rs. 2,00,000/- (RUPEES TWO LACS ONLY).

ONE TIME EMD WILL ALSO BE Rs. 2 LACS.

EMD SHALL BE DEPOSITED IN CASH (AS PERMISSIBLE UNDER INCOME TAX ACT), PAY ORDER OR DEMAND DRAFT (PAYABLE AT NAGPUR IN FAVOUR OF 'BHARAT HEAVY ELECTRICALS LIMITED') ONLY. **NO OTHER FORM OF EMD REMITTENCE SHALL BE ACCEPTABLE TO BHEL.**

15.1.1 EMD BY THE TENDERER WILL BE FORFEITED AS PER TENDER DOCUMENTS IF

I) AFTER OPENING THE TENDER, THE TENDERER REVOKES HIS TENDER WITHIN THE VALIDITY PERIOD OR INCREASES HIS EARLIER QUOTED RATES.

II) THE TENDERER DOES NOT COMMENCE THE WORK WITHIN THE PERIOD AS PER LOI / CONTRACT. IN CASE THE LOI / CONTRACT IS SILENT IN THIS REGARD THEN WITHIN 15 DAYS AFTER AWARD OF CONTRACT.

15.1.2 EMD SHALL NOT CARRY ANY INTEREST.

15.2 SECURITY DEPOSIT

15.2.1 SECURITY DEPOSIT SHOULD BE COLLECTED FROM THE SUCCESSFUL TENDERER. THE RATE OF SECURITY DEPOSIT WILL BE AS BELOW:

SN	Contract Value	Security Deposit Amount
1	Up to Rs. 10 lakhs	10% of Contract Value
2	Above Rs. 10 lakhs upto Rs.50 lakhs	1 lakh + 7.5% of the Contract Value exceeding Rs. 10 lakhs.
3	Above Rs. 50 lakhs	Rs 4 lakhs + 5% of the Contract Value exceeding Rs. 50 lakhs.

THE SECURITY DEPOSIT SHALL BE REMITTED <u>BEFORE START OF THE WORK</u> BY THE CONTRACT OR IN THE MANNER SPECIFIED AS FOLLOWS.

15.2.2 SECURITY DEPOSIT MAY BE FURNISHED IN ANY ONE OF THE FOLLOWING FORMS

I) CASH (AS PERMISSIBLE UNDER THE INCOME TAX ACT)

II) PAY ORDER, DEMAND DRAFT IN FAVOUR OF BHEL.

III) LOCAL CHEQUES OF SCHEDULED BANKS, SUBJECT TO REALIZATION.

IV) SECURITIES AVAILABLE FROM POST OFFICES SUCH AS NATIONAL SAVINGS CERTIFICATES, KISAN VIKAS PATRAS ETC.

(CERTIFICATES SHOULD BE HELD IN THE NAME OF CONTRACTOR FURNISHING THE SECURITY AND DULY PLEDGED IN FAVOUR OF BHEL AND DISCHARGED ON THE BACK).

V) BANK GUARANTEE FROM SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT SUBJECT TO A MAXIMUM OF 50% OF THE TOTAL SECURITY DEPOSIT VALUE. THE BALANCE 50% HAS TO BE REMITTED EITHER BY CASH OR IN THE OTHER FORM OF SECURITY. THE BANK GUARANTEE FORMAT SHOULD HAVE THE APPROVAL OF BHEL.

VI) FIXED DEPOSIT RECEIPT ISSUED BY SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT. THE FDR SHOULD BE IN THE NAME OF THE CONTRACTOR, A/C BHEL, DULY DISCHARGED ON THE BACK.

VII) SECURITY DEPOSIT CAN ALSO BE RECOVERED AT THE RATE OF 10% FROM THE RUNNING BILLS. HOWEVER IN SUCH CASES AT LEAST 50% OF THE SECURITY DEPOSIT SHOULD BE REMITTED (BY BANK GUARANTEE OR DEMAND DRAFT) BEFORE START OF THE WORK AND THE BALANCE 50% MAY BE RECOVERED FROM THE RUNNING BILLS.

VIII) EMD OF THE SUCCESSFUL TENDERER, EXCEPTING THOSE WHO HAVE REMITTED ONE TIME EMD, SHALL BE CONVERTED AND ADJUSTED AGAINST THE SECURITY DEPOSIT OR SPECIFIC REQUEST BY THE CONTRACTOR.

IX) THE SECURITY DEPOSIT SHALL NOT CARRY ANY INTEREST.

NOTE: ACCEPTANCE OF SECURITY DEPOSIT AGAINST SL. NO. (IV) AND (VI) ABOVE WILL BE SUBJECT TO HYPOTHECATION OR ENDORSEMENT ON THE DOCUMENTS IN FAVOUR OF BHEL. HOWEVER, BHEL WILL NOT BE LIABLE OR RESPONSIBLE IN ANY MANNER FOR THE COLLECTION OF INTEREST OR RENEWAL OF THE DOCUMENTS OR IN ANY OTHER MATTER CONNECTED THEREWITH.

15.2.3 SECURITY DEPOSIT SHALL NOT BE REFUNDED TO THE CONTRACTOR EXCEPT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
FROM TRICHY (CUST NO - 0391)							
A		**STRUCTURES**					
1	24 225	SV SILENCER SUPPORT	17.36	BLU	STR		
2	24 235	START VENT SIL SUPRT	1.13	DL	STR		
		PG WEIGHT				18.49	
3	30 103	SEAL PLATE ASSY	2.70	BLU	STR		
4	30 105	FUR BOTTOM ENCL FRAM	5.06	BLU	STR		
5	30 211	FURREAR ARCH ENCL	1.81	BLU	STR		
6	30 212	FUR EXTD BOT ENCL	8.44	BLU	STR		
7	30 215	MAIN BOILER ENCL	3.85	BLU	STR		
8	30 219	VERT ROOF ENCL	40.64	BLU	STR		
9	30 220	DECK SPRT AND SEALS	24.54	BLU	STR		
		PG WEIGHT				87.05	
10	35 010	FOUNDATION MATERIALS	10.16	BES	STR		
11	35 110	MAIN COLUMNS LEFT	188.82	DL	STR		
12	35 120	MAIN COLUMNS RIGHT	188.88	DL	STR		
13	35 130	MAIN COLUMNS MIDDLE	100.85	DL	STR		
14	35 140	AUXILIARY COLUMNS-LE	59.18	DL	STR		
15	35 150	AUXILIARY COLUMNS-RI	51.78	DL	STR		
16	35 160	AIRHEATER COLUMNS	36.63	DL	STR		
17	35 190	GIRDER PIN CONNECTIO	6.70	DL	STR		
18	35 210	BOILER CEILING STRUC	282.22	DL	STR		
19	35 220	BOILER CEILING STRUC	48.41	DL	STR		
20	35 230	BOILER CEILING STRUC	12.41	DL	STR		
21	35 310	HORIZONTAL BRACING I	17.26	DL	STR		
22	35 320	HORIZONTAL BRACING I	17.58	DL	STR		
23	35 330	HORIZONTAL BRACING I	16.46	DL	STR		
24	35 340	HORIZONDAL BRACING I	20.91	DL	STR		
25	35 350	HORIZONDAL BRACING V	13.59	DL	STR		
26	35 360	HORIZONDAL BRACING V	14.47	DL	STR		
27	35 380	LANDING PLATFORMS	32.20	DL	STR		
28	35 390	PLATFORM AT DRUM FLO	39.21	DL	STR		
29	35 441	HORIZONTAL BEAMS-LOW	76.95	DL	STR		
30	35 443	HORIZONTAL BEAMS-UPP	64.28	DL	STR		
31	35 511	FRON T BRACING-LOWER	16.69	DL	STR		
32	35 513	FRONT BRACING-UPPER	18.43	DL	STR		
33	35 521	SIDE BRACING-LOWER	43.13	DL	STR		
34	35 523	SIDE BRACING-UPPER	45.14	DL	STR		
35	35 531	REAR BRACING-LOWER	30.53	DL	STR		
36	35 532	REAR BRACING-MIDDLE	23.92	DL	STR		
37	35 533	REAR BRACING-UPPER	23.92	DL	STR		
38	35 610	BOILER ROOF STRUCTUR	61.88	DL	STR		
39	35 611	BOILER ROOF SHEETING	25.80	DL	STR		
40	35 700	HSFG FASTENERS FOR P	5.60	DL	STR		
41	35 811	FLOOR GRILLS AND GUA	80.67	DL	STR		
42	35 820	STAIRS	27.51	DL	STR		
43	35 851	HAND RAILS AND POSTS	23.73	DL	STR		
44	35 993	CONSUMABLESANDERECTI	10.98	DL	STR		
		PG WEIGHT				1,736.85	

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
45	36 310	MAIN MBL FLOOR 11TH	31.83	HT	STR		
46	36 311	MAIN FLOOR I MBL 1ST	18.12	HT	STR		
47	36 320	MAIN FLOOR 12TH LEVE	45.04	HT	STR		
48	36 321	MAIN FLOOR II MBL IS	90.41	HT	STR		
49	36 322	MAIN FLOOR II MBL 2N	19.99	HT	STR		
50	36 330	MAIN FLOOR 13TH LEVE	43.51	HT	STR		
51	36 331	MAIN FLOOR III MBL 1	18.31	HT	STR		
52	36 332	MAIN FLOOR III MBL 2	9.23	HT	STR		
53	36 340	MAIN FLOOR 14TH LEVE	23.81	HT	STR		
54	36 341	MAIN FLOOR IV MBL 1S	27.50	HT	STR		
55	36 350	MAIN FLOOR 15TH LEVE	37.48	HT	STR		
56	36 351	MAIN FLOOR V MBL IST	16.04	HT	STR		
57	36 352	MAIN FLOOR V MBL II	7.76	HT	STR		
58	36 360	MAIN FLOOR 16TH LEVE	10.56	HT	STR		
59	36 361	MAIN FLOOR VI MBL 1S	21.65	HT	STR		
60	36 380	LANDING PLATFORMS	4.50	HT	STR		
61	36 391	MISCELLANEOUS PLATFO	55.69	HT	STR		
62	36 392	MISCELLANEOUS PLATFO	243.40	HT	STR		
63	36 393	MISCELLANEOUS PLATFO	10.42	HT	STR		
64	36 610	BOILER ROOF STRUCTUR	12.45	HT	STR		
65	36 611	BOILER ROOF SHEETING	21.31	HT	STR		
66	36 612	WEATHER PRO TECTION F	12.11	BLU	STR		
67	36 620	BOILER SIDE CLADDING	38.76	BLU	STR		
68	36 740	POSTS AND HANGERS	19.49	HT	STR		
69	36 811	FLOORGRILLSANDGUARDP	56.49	HT	STR		
70	36 813	FLOORGRILLSANDGUARDP	31.24	HT	STR		
71	36 814	FLOORGRILLSANDGUARDP	1280	HT	STR		
72	36 820	STAIRS AND LADDERS	1.23	HT	STR		
73	36 851	HANDRAILS AND POSTS	23.73	HT	STR		
74	36 853	HANDRAILS AND POSTS	20.67	HT	STR		
		PG WEIGHT				985.52	
75	38 110	LIFT COLUMNS	28.59	SYN	STR		
76	38 210	INTER CONN PLATFORMS	4.56	SYN	STR		
77	38 299	MILL HANDLING MONORA	43.74	BLU	STR		
78	38 310	CONN PLATFORMS TO MI	45.60	SYN	STR		
79	38 410	MILL MAINTANANCE PLA	45.71	SYN	STR		
80	38 510	LIFT BEAMS AND BRACI	54.22	BLU	STR		
81	38 610	ELEVATOR CLADDING ST	15.50	BLU	STR		
82	38 611	ELEVATOR CLADDING SH	13.84	BLU	STR		
83	38 710	LIFT MACHINE ROOM DE	8.06	BLU	STR		
84	38 810	FLOORGRILLS AND GUAR	7.56	BLU	STR		
85	38 820	STAIRS AND LADDERS	3.00	SYN	STR		
86	38 850	HAND RAILS AND HAND	6.88	BLU	STR		
		PG WEIGHT				277.27	
87	39 012	FOUNDATION MATERIALS	9.97	DL	STR		
88	39 101	COLUMNS FRAMES BEFOR	48.67	BLU	STR		
89	39 102	COLUMNS FRAMES BEFOR	147.12	BLU	STR		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
90	39 140	COLS FRAMES NEAR I.D	55.64	BLU	STR		
91	39 150	COL FRAMES BETN I.D.	180.88	BLU	STR		
92	39 300	PLATFORMS - EXTERNAL	155.44	BLU	STR		
93	39 301	STRUC AND PLATFORM F	4.52	BLU	STR		
94	39 302	STRUC FOR MOTOR HOOD	7.44	BLU	STR		
95	39 303	MONORAIL BEAMS FOR F	13.88	BLU	STR		
96	39 304	FAN HANDLING STRUCTU	9.39	BLU	STR		
97	39 305	FAN HANDLING STRUCTU	15.52	BLU	STR		
98	39 810	FLOOR GRILL	19.64	BLU	STR		
99	39 820	STAIRS	7.20	BLU	STR		
100	39 850	HAND RAIL AND HAND R	9.81	BLU	STR		
101		SITE FABRICATED STRUCTURE	200.00	SYN	STR	885.11	
		SUB TOTAL - A (STRUCTR)	**3,990.29**				
B		**PRESSURE PARTS**					
1	04 126	UPR DRUM(NOINTL)	138.60	DL	PP		
2	04 136	UPR DRUM INTERLS	4.06	DL	PP		
3	04 146	UPR DRUM SUSPENSN	13.66	DL	PP		
		PG WEIGHT				156.31	
4	05 137	FRONT WW LWR INL HDR	13.73	HT	PP		
5	05 147	REAR WW LWR INL HDR	13.73	HT	PP		
6	05 155	SIDE WW LWR INL HDR	16.70	HT	PP		
7	05 175	EXT SIDE WW INL HDR	1.28	HT	PP		
8	05 227	REAR WW HANG OUT HDR	2.73	HT	PP		
9	05 229	REAR WW SCRN OUT HDR	5.26	HT	PP		
10	05 231	FRONT WW UPR OUT HDR	3.75	HT	PP		
11	05 251	SIDE WW UPR OUT HDR	6.86	HT	PP		
		PG WEIGHT				64.04	
12	06 400	BURNER PANEL	15.82	HT	PP		
13	06 631	FRONT UPPER WW PANEL	45.56	HT	PP		
14	06 634	FRONT INTER WW PANEL	28.26	HT	PP		
15	06 637	FRONT LOWER WW PANEL	22.43	HT	PP		
16	06 644	REAR INTER WW PANEL	45.40	HT	PP		
17	06 647	REAR LOWER WW PANEL	22.43	HT	PP		
18	06 651	SIDE UPPER WW PANEL	64.25	HT	PP		
19	06 655	SIDE LOWER WW PANEL	60.52	HT	PP		
20	06 670	EXTD SIDE WW PANEL	8.37	HT	PP		
		PG WEIGHT				313.03	
21	07 108	DOWNCOMER UPPER PPG	64.76	HT	PP		
22	07 109	DOWNCOMER LOWER PPG	86.36	HT	PP		
23	07 215	SIDE RELIEF TUBES	20.28	HT	PP		
24	07 216	HANGER RELIEF TUBES	20.21	HT	PP		
25	07 218	FRONT RELIEF TUBES	6.57	HT	PP		
26	07 223	FURN SCREEN TUBES	22.51	HT	PP		
27	07 225	FURN REAR HGR TUBES	9.67	HT	PP		
28	07 226	FURN REAR ARCH TUBES	16.45	HT	PP		
29	07 231	LWR CORNER TRNS TUBE	1.82	HT	PP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
30	07 232	UPR CORNER TRNS TUBE	0.54	HT	PP		
31	07 401	WW HDR SUSPENSION	16.73	HT	PP		
32	07 410	DOWNCOMER SUSPENSION	7.66	HT	PP		
33	07 420	DC SEISMIC GUIDES	3.58	HT	PP		
34	07 431	RISER TUBE SUPPORT	2.19	HT	PP		
35	07 500	MISC PR.PART COMPNTS	0.31	HT	PP		
36	07 501	FURN INSERT TUBES	2.13	HT	PP		
37	07 601	PRESSURE PART SEALS	0.98	HT	PP		
38	07 700	BULKED BPS ITEMS	0.90	HT	PP		
39	07 992	IMPORTED ELECTRODES	0.08	HT	PP		
40	07 993	EREC MATLS, CONSUMES	0.45	HT	PP		
		PG WEIGHT				284.18	
41	10 135	HOR SPACE SH INLHDR	7.20	HT	PP		
42	10 174	VER SPACE SH INL HDR	11.03	HT	PP		
43	10 178	VER PLATN SH INL HDR	7.37	HT	PP		
44	10 182	SH REAR WALL IN HDR	3.75	HT	PP		
45	10 183	SIDE WALL SH INL HDR	5.33	HT	PP		
46	10 184	EXTSIDEWAL SH IN HDR	0.62	HT	PP		
47	10 185	FRONT WALL SH IN HDR	3.68	HT	PP		
48	10 191	RAD ROOF SH INL HDR	2.86	HT	PP		
49	10 235	HOR SPACE SH OUT HDR	8.69	HT	PP		
50	10 274	VER SPACE SH OUT HDR	15.35	HT	PP		
51	10 278	VER PLATN SH OUT HDR	7.99	HT	PP		
52	10 283	SIDE WALL SH OUT HDR	4.94	HT	PP		
53	10 284	SH EXSIDEWALL OUTHDR	1.00	HT	PP		
54	10 291	RAD ROOF SH OUT HDR	5.55	HT	PP		
55	10 687	ROOF SH JUNCTION HDR	3.18	HT	PP		
		PG WEIGHT				88.54	
56	11 236	HOR SPC SH UPR COIL	108.46	HT	PP		
57	11 237	SH HORZTL COIL +ATT	132.21	HT	PP		
58	11 274	VER SPACED SH COIL	99.90	HT	PP		
59	11 278	VER PLATEN SH COIL	111.99	HT	PP		
60	11 616	SH REAR PNL	14.69	HT	PP		
61	11 618	SH REAR PNL	6.79	HT	PP		
62	11 684	EXT SIDEWALL SH PANE	3.61	HT	PP		
63	11 685	FRONT WALL SH PANEL	12.38	HT	PP		
64	11 686	SH ROOF PNL	13.29	HT	PP		
65	11 687	REAR ROOF SH PANEL	10.43	HT	PP		
66	11 688	SH ROOF PANL+HDR	15.07	HT	PP		
67	11 691	RAD ROOF SH PANEL	20.55	HT	PP		
68	11 694	EXT BOTTOM SH PANEL	2.69	HT	PP		
		PG WEIGHT				552.06	
69	12 174	VERSPACE SH INL LINK	7.96	HT	PP		
70	12 184	SIDEWALL SH INL TUBE	2.20	HT	PP		
71	12 187	REARROOF SH INL TUBE	1.24	HT	PP		
72	12 535	HOR SPC SH TERL TUBE	38.08	HT	PP		
73	12 800	SH DESUP-STAGE-II	3.70	HT	PP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
74	12 803	SH SC SPACER TUBES	1.06	HT	PP		
75	12 805	SH FRONT HANGER TUBE	5.08	HT	PP		
76	12 850	SH CONN PIPES SATUR	5.29	HT	PP		
77	12 852	SH DESH LINKS	11.16	HT	PP		
78	12 900	SH DESH	2.34	HT	PP		
79	12 903	SH MISCL COMPONENTS	24.67	HT	PP		
80	12 906	SH LINK SUPPORTS	4.66	HT	PP		
81	12 914	EXPN -SH RAD ROOF HDR	0.63	HT	PP		
82	12 917	SUSPN OF RADINT ROOF	3.86	HT	PP		
83	12 924	SUSPN-SH BAKPASS HDR	13.16	HT	PP		
84	12 927	SUSPN OF REAR ROOF	233	HT	PP		
85	12 928	SUSPN - SH REAR WALL	4.87	HT	PP		
86	12 944	SUSPN-SH PLATEN HDRS	1.68	HT	PP		
87	12 948	SUSP-VERT SPACD ASSY	18.27	HT	PP		
88	12 954	SUSP-VERT SPACD HDRS	4.27	HT	PP		
89	12 968	SUSPN OF PLATEN ASSY	15.40	HT	PP		
90	12 992	IMPORTED ELECTRODES	0.07	HT	PP		
91	12 993	EREC MATLS, CONSUMES	0.32	HT	PP		
		PG WEIGHT				172.29	
92	15 174	VER SPACE RH INLHDR	4.12	HT	PP		
93	15 274	VER SPACE RH OUT HDR	15.80	HT	PP		
						19.92	
94	16 275	VERSPC RH FRONT COIL	65.91	HT	PP		
95	16 277	VERSPC RH REAR COIL	80.27	HT	PP		
		PG WEIGHT				146.17	
96	17 900	RH DESH	1.81	BLU	PP		
97	17 904	RH HDR SUPRT AB ROOF	4.78	HT	PP		
98	17 919	RH FRONT SUSPENSION	7.57	HT	PP		
99	17 929	RH REAR SUSPENSION	13.27	HT	PP		
100	17 992	IMPORTED ELECTRODES	0.04	HT	PP		
		PG WEIGHT				27.47	
101	19 114	PT ECO UPR COIL&SUP	101.93	HT	PP		
102	19 124	PT ECO LWR COIL&SUP	120.09	HT	PP		
103	19 700	BULKED BPS COMP	0.30	HT	PP		
104	19 701	ECO INLET HEADERS	5.72	HT	PP		
105	19 702	ECO OUTLET HEADERS	4.81	HT	PP		
106	19 753	ECO INTER REAR HDR	2.71	HT	PP		
107	19 763	ECO INTER FRONT HDR	2.71	HT	PP		
108	19 783	ECO INTER CENTR HDR	2.70	HT	PP		
109	19 802	ECO HANGER TUBES	13.90	HT	PP		
110	19 850	ECO FEED PIPE	2.94	HT	PP		
111	19 851	ECO LINKS TO DRUM	10.26	HT	PP		
112	19 904	ECO HDR SUPT AB ROOF	11.69	HT	PP		
113	19 905	ECO HDR SUPT BL ROOF	6.82	HT	PP		
114	19 906	ECO LINE&LINK SUPORT	0.77	HT	PP		
115	19 992	IMPORTED ELECTRODES	0.03	HT	PP		
		PG WEIGHT				287.37	

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
116	21 600	S.B. PPG & FITTINGS	6.64	SYN	PP		
117	21 601	S.B PIPING SUPPORTS	5.65	SYN	PP		
118	21 700	BULKED BPS COMP	0.84	SYN	PP		
119	21 800	SB VALVES (BHEL)	0.53	SYN	PP		
120	21 825	SB VALVES (SUBDELY)	0.25	SYN	PP		
121	21 850	SB SAFETY VALVE BHEL	0.02	SYN	PP		
122	21 992	IMPORTED ELECTRODES	0.04	SYN	PP		
		PG WEIGHT				13.98	
123	24 200	TRIM PIPES&FITTINGS	34.31	HT	PP		
124	24 201	TRIM PIPING SUPPORTS	6.66	HT	PP		
125	24 215	SPRWAT SYST RH UTY	4.44	BLU	PP		
126	24 240	SAMPLE COOLER&SUPRT	0.57	BLU	PP		
127	24 260	VALVES BHEL	13.92	HT	PP		
128	24 265	VALVES & FITTINGS SD	3.49	BLU	PP		
129	24 273	DIRECT WTR LVL GAUGE	0.25	BLU	PP		
130	24 275	HDRS FOR TRIM PIPE	0.88	HT	PP		
131	24 280	SAFETY VAL & ERV-BHE	4.25	HT	PP		
132	24 345	SH TO BLR STOP VALVE	9.87	HT	PP		
133	24 346	H&S MS PIPING FOR HT	5.94	HT	PP		
134	24 350	BLR FILLING PIPING	0.84	HT	PP		
135	24 351	H&S BLR FILLING PPG	0.50	HT	PP		
136	24 700	BULKED BPS COMP	0.31	HT	PP		
137	24 991	IMPO ELE FOR MS&BLR	0.12	HT	PP		
138	24 992	IMPORTED ELECTRODES	0.03	BLU	PP		
139	24 994	NAME PLATES	0.23	SYN	PP		
		PG WEIGHT				86.62	
140	42 002	STEAM BLOW MATERIALS	0.46	BLU	PP		
141	42 128	PIPING,P.HOUSE STM	0.35	BLU	PP		
142	42 158	PIPING,OP.FLR STM	2.73	BLU	PP		
143	42 300	BHEL VALVE F.O. SYS	0.50	BLU	PP		
144	42 358	B.VALVE,OP.FLR STM	0.41	BLU	PP		
		PG WEIGHT				4.45	
145	81 009	IBD EXPANDER - 2500	6.54	BLU	PP		
146	81 415	TEST THERMOWELLS	0.40	BLU	PP		
		PG WEIGHT				6.94	
147	97 088	ELECTRONIC LVL INDR	1.53	BLU	PP		
148	97 297	MTM CLAMPS & PADS	0.03	HT	PP		
		PG WEIGHT				1.57	
		SUB TOTAL - B (PR PARTS)	**2,224.92**				
C		**NON PRESSURE PARTS**					
1	08 101	FURNACE UPPER BUCKST	53.93	HT	NPP		
2	08 104	FURNACE INTERMEDIATE	42.54	HT	NPP		
3	08 107	FU RNACE LOWER BUCKST	30.60	HT	NPP		
4	08 111	FURNACE REAR ARCH BU	2.18	HT	NPP		
5	08 380	FURNACE BOTTOM SUPPO	34.41	HT	NPP		
6	08 400	FURNACE GUIDE	6.60	HT	NPP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
7	08 500	FURNACE BACK PASS BU	60.58	HT	NPP		
8	08 700	EX.MOVEMENT MEASUREM	0.50	BLU	NPP		
9	08 900	FURNACE KEY BUCKSTAY	2.40	HT	NPP		
		PG WEIGHT				233.75	
10	09 001	SEAL BOX FURN OPENG	6.21	HT	NPP		
11	09 002	SEAL BOX INST OPENG	1.74	HT	NPP		
12	09 003	MATL FOR INST TAPPG	0.19	BLU	NPP		
		PG WEIGHT				8.14	
13	18 001	FUR ROOF SKIN CASING	10.54	BLU	NPP		
14	18 010	PR PARTS ATTACH-CASG	2.09	HT	NPP		
15	18 020	VIBRATION SNUBBERS	0.30	HT	NPP		
		PG WEIGHT				12.93	
16	20 051	LONG RETRACT SB M11E	24.13	SYN	NPP		
17	20 054	WALL BOX NPR LRSB MI	0.52	SYN	NPP		
18	20 201	WALL DESLAGGER RW5E	9.14	SYN	NPP		
19	20 204	WALL BOX NPR-RW5E	1.11	SYN	NPP		
20	20 511	DA HEAD VALVE ASSY	0.13	SYN	NPP		
21	20 794	WALL BOX NPR FOR TP	0.06	SYN	NPP		
22	20 972	TEMP PROBE DUPLTC	1.55	BLU	NPP		
		PG WEIGHT				36.64	
23	24 220	SV ESCAPE PIPES	19.09	BLU	NPP		
24	24 285	SV&ERV SILNCER BHEL	34.14	BLU	NPP		
		PG WEIGHT				53.23	
25	28 220	DOORS	4.59	BLU	NPP		
26	28 700	BPS FASTENERS	0.65	BLU	NPP		
		PG WEIGHT				5.24	
27	31 010	COMPS WELDED TO PR	3.43	HT	NPP		
28	31 102	FUR BOT SKIN CSG	1.02	BLU	NPP		
29	31 104	FUR REAR ARCH SKIN	5.48	BLU	NPP		
30	31 105	SEC PASS SKIN CSG	0.31	BLU	NPP		
		PG WEIGHT				10.23	
31	41 350	ACOIL GUN ASSY	0.81	BLU	NPP		
32	41 390	OIL GUN VICE&RACK	0.83	BLU	NPP		
33	41 500	HEA IGNITOR	0.20	BLU	NPP		
		PG WEIGHT				1.84	
34	42 001	PNEUMATIC FITTINGS	0.02	BLU	NPP		
35	42 005	INSTRUMENT FITTINGS	0.30	BLU	NPP		
36	42 010	LFO PUMP SET	2.57	BLU	NPP		
37	42 020	HFO PUMP SET	4.74	BLU	NPP		
38	42 030	HFO HEATER SET	7.66	BLU	NPP		
39	42 046	DO PUMP-MOTOR ASSY	0.17	BLU	NPP		
40	42 065	DRAIN OIL TANK	1.01	BLU	NPP		
41	42 070	BURNER STN SKID ASLY	4.13	BLU	NPP		
42	42 120	PIPING,PH FUEL OIL	3.57	BLU	NPP		
43	42 150	PIPING, OFLR HFO/TRC	2.90	BLU	NPP		
44	42 152	PIPING,OP.FLR LFO	0.92	BLU	NPP		
45	42 154	PIPING,OP.FLR DO	0.73	BLU	NPP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
46	42 157	PIPING,OP.FLR AIR	0.85	BLU	NPP		
47	42 170	PIPING OIL BNR FTG	2.00	BLU	NPP		
48	42 200	SUB.DEL FO SYSTEM	0.44	BLU	NPP		
49	42 700	BULKED BPS COMPONENT	0.43	BLU	NPP		
50	42 992	IMPORTED ELECTRODES	0.01	BLU	NPP		
		PG WEIGHT				32.44	
51	43 004	ASSY SCNR&GUN AIR SY	1.68	BLU	NPP		
52	43 005	ASSY MILL AIR SYSTEM	6.71	BLU	NPP		
53	43 006	ASSY FEEDER AIR SYST	0.06	SYN	NPP		
54	43 104	M/C SCNR&GUN AIR SYS	8.19	BLU	NPP		
55	43 105	M/C MILL AIR SYSTEM	27.64	SYN	NPP		
56	43 106	M/C FEEDER AIR SYSTE	0.07	SYN	NPP		
57	43 200	SUBDEL,IGNR,SCNR AIR	10.25	BLU	NPP		
		PG WEIGHT				54.60	
58	45 220	WBOX ASSY 22-IN	61.91	HT	NPP		
59	45 221	WBOX SUPRT 22-IN	5.89	BLU	NPP		
		PG WEIGHT				67.80	
60	47 221	FUEL PIPE SUPRT 22IN	13.84	SYN	NPP		
61	47 223	COUPLING,ORIFICE ETC	18.82	BLU	NPP		
62	47 229	ST PIPE& SHOP BENDS	175.11	SYN	NPP		
63	47 700	STOCKED FASTENERS	0.87	SYN	NPP		
		PG WEIGHT				208.64	
64	48 012	SQ.DUCT-FDFAN TO A.H	57.26	BLU	NPP		
65	48 014	EXP.PCS-FDFAN TO A.H	5.03	BLU	NPP		
66	48 015	SUPPORT-FDFAN TO A.H	7.57	BLU	NPP		
67	48 019	AIRDUCT SUP FDN MATL	1.73	DL	NPP		
68	48 112	SQ.DUCT-PAFAN-PRI-AH	56.47	SB	NPP		
69	48 114	EXP.PCS-PAFAN-PRI-AH	2.46	SB	NPP		
70	48 115	SUPPORT-PAFAN-PRI-AH	3.93	SB	NPP		
71	48 132	SQ.DUCT-PAFANCOLDBUS	4.50	SB	NPP		
72	48 141	SEAL AIR HAG&ID GATE	1.79	SB	NPP		
73	48 142	SQ.DUCT-COLDAIRBUS	6.28	SB	NPP		
74	48 144	EXP.PCS-COLDAIRBUS	0.16	SB	NPP		
75	48 145	SUPPORT-COLDAIRBUS	0.77	SB	NPP		
76	48 200	INS TAPPINGS ON DUCT	3.78	BLU	NPP		
77	48 202	SQDUCT AH-WIND BOX	39.05	BLU	NPP		
78	48 204	EXPPCS AH-WIND BOX	11.28	BLU	NPP		
79	48 205	SUPORT AH-WIND BOX	7.36	BLU	NPP		
80	48 207	FLOWMTR-SEC AIRFLOW	5.89	BLU	NPP		
81	48 209	LINKAGES FOR DAMPERS	8.11	BLU	NPP		
82	48 212	SQDUCT WIND BOX CONN	8.83	BLU	NPP		
83	48 214	EXPPCS WIND BOX CONN	3.54	BLU	NPP		
84	48 222	SQDUCT AH-HOTAIRBUS	37.32	BLU	NPP		
85	48 224	EXPPCS AH-HOTAIRBUS	2.05	BLU	NPP		
86	48 225	SUPORT AH-HOTAIRBUS	4.54	BLU	NPP		
87	48 382	SQ DUCT ECO-AIRHEATR	77.30	HT	NPP		
88	48 385	SUPPORT ECO-AIRHEATR	10.41	BLU	NPP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG	MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
89	48	432	SQDUCT AH-BLROUTFL	52.99	BLU	NPP		
90	48	435	SUPORT AH -BLROUTFL	10.04	BLU	NPP		
91	48	462	SQDUCT BLROUTFL-EP	244.24	BLU	NPP		
92	48	465	SUPORT BLR OUTFL-EP	51.57	BLU	NPP		
93	48	466	PLATFORM&LADDER-GATE	18.96	BLU	NPP		
94	48	482	SQ.DUCT-EP/MP-IDFAN	87.68	BLU	NPP		
95	48	485	SUPPORT EP/MP-IDFAN	6.80	BLU	NPP		
96	48	492	SQ.DUCT IDFAN-CHIMNY	101.64	BLU	NPP		
97	48	494	EXPNPCS IDFAN-CHIMNY	64.04	BLU	NPP		
98	48	495	SUPORT IDFAN -CHIMNEY	20.22	BLU	NPP		
99	48	499	CHIMNEY WALL FRAMES	1.04	BLU	NPP		
100	48	700	BULKED BPS COMPONENT	2.49	BLU	NPP		
101	48	812	SQDUCT, H.A. BUS-PAF	14.07	SB	NPP		
102	48	814	EXPPCS, H.A.BUS-PAFA	0.78	SB	NPP		
103	48	815	SUPORT,H.A.BUS-PAFAN	1.55	SB	NPP		
104	48	817	FLOWMTR, HOT PRI AIR	6.01	SB	NPP		
105	48	852	SQDUCT,H,A-MILLINLET	24.62	SB	NPP		
106	48	854	EXPPCS,HA-MILLINLET	2.37	SB	NPP		
107	48	855	SUPORT,HA-MILLINLET	1.22	SB	NPP		
108	48	862	SQDUCT,HA MILLBYPASS	12.73	SB	NPP		
109	48	864	EXPPCS,HA MILLBYPASS	1.58	SB	NPP		
110	48	865	SUPORT,HA,MILLBYPASS	0.48	SB	NPP		
111	48	867	FLOWMTR,HA MILLBYPAS	1.84	SB	NPP		
112	48	872	SQDUCT,HA-RAWCO1LPIP	9.53	SB	NPP		
113	48	874	EXPPCS,HA-RAWCOALPIP	0.44	SB	NPP		
114	48	882	SQDUCT,HA-MILLOUTLET	9.74	SB	NPP		
115	48	993	ERECTON-MATERIALS	3.44	BLU	NPP		
							1,119.47	
116	67	204	RAW COAL GATES	3.03	SYN	NPP		
117	67	272	COALVALVE -36 MOT OPR	5.67	SYN	NPP		
118	67	276	RAWCOAL GATE-CHAIN36	5.97	SYN	NPP		
119	67	283	FDR ISOLATION GATE	7.40	SYN	NPP		
120	67	801	DOWN SPOUT	16.01	SYN	NPP		
121	67	802	BUNKER EMPTYINGCHUTE	10.71	SYN	NPP		
122	67	803	FEED PIPE TO MILL	13.30	SYN	NPP		
							62.07	
123	81	128	H P DOSING SYSTEM	3.00	BLU	NPP		
124	81	432	CONSUM & EREC MATLS	0.00	SB	NPP		
							3.00	
125	97	593	ELEVATOR & ACCESSORI	30.00	SYN	NPP		
126	97	599	PNEU.ACTUR A&FG SYS	3.60	BLU	NPP		
							33.60	
127	99	100	FAN HANDLING EQUIPT	11.03	SYN	NPP		
128	99	400	SCAPH,RAPH HANDLG EQ	1.00	SYN	NPP		
129	99	514	FURN CRADL-4WALC	2.65	SYN	NPP		
							14.68	

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

S N	PG MA	DESCRIPTION	WEIGHT	ACTIVITY	PKG	PG WT	REMARKS
130		CERALINE BENDS FOR COAL PIPE	100.00	SYN			
131		LIGHT WEIGHT CONCRETE SLABS	120.00	BLU		220.00	
		SUB TOTAL - C (NON PR PT)	**2,178.29**				
D		**SG PIPING**					
1	80 343	AS TO SOOTBLOWERS	1.28	BLU	PPG		
2	80 344	AS TO FO PH TNK HEAT	10.43	BLU	PPG		
3	80 351	AS TO MISC USERS-SG	2.50	SYN	PPG		
4	80 366	IBD TANK VENT	8.17	BLU	PPG		
5	80 395	Aux Steam Atomising	0.53	BLU	PPG		
6	80 418	ERCS MATLS FOR INSTS	0.30	BLU	PPG		
7	80 450	CBD & EMERGY DRAIN	5.14	BLU	PPG		
8	80 451	BOILER DRAINS	3.32	BLU	PPG		
9	80 453	LP PIPING DRAINS-SG	0.93	BLU	PPG		
10	80 455	MISC EQPT DRAINS-SG	3.96	SYN	PPG		
11	80 460	SG AUX COOL WTR IND	41.01	BLU	PPG		
12	80 471	BOILER WASH-UNIT	3.81	SYN	PPG		
13	80 480	FIRE WATER-O THERS	5.53	BLU	PPG		
14	80 600	HP DOZING	0.34	BLU	PPG		
15	80 612	SERVICE AIR-UNIT	2.32	BLU	PPG		
16	80 616	INST AIR UNIT	5.42	BLU	PPG		
17	80 650	F.O.SUPPLY&RETN LINE	10.03	BLU	PPG		
18	80 901	SD VALVES & SPL-L	0.70	BLU	PPG		
19	80 905	BHEL VALVES-L	3.40	BLU	PPG		
20	80 907	BHEL VALVES-S	0.09	SYN	PPG		
21	80 921	H&S FOR LIGHTUP SL	5.83	BLU	PPG		
22	80 922	H&S FOR LIGHTUP NSL	9.73	BLU	PPG		
23	80 992	IMPORTED ELECTRODES	0.04	HT	PPG		
						124.79	
33	97 282	FLOWMETERS	0.38	BLU	PPG		
						0.38	
		SUB TO TAL - D (SG PIPING)	**125.17**				
E		**ROTATING MACHINES**					
1	65 736	36GRAVIMETRIC FEEDER	38.24	SYN	RTM		
		MOTORS	133.40				BHOPAL
		BREAKERS	18.00				BHOPAL
						189.64	
		SUB TOTAL - E (ROT. M/C)	**189.64**				
		TOTAL WEIGHT W O - 0391	**8,708.30**				

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

SN	PGMA	DESCRIPTION	WT.(KG)	IBR	ACTIVITY	PACKAGE	REMARKS
FROM PIPING CENTRE (CUST NO 691 1)							
F		**POWER CYCLE PIPING**					
1	80-301	MS FROM BO ILER STOP VALVE TO ESV	80,100.00	I	SB	PP	
2	80-303	MS HEADER TO AUX PRDS	4,327.00	I	SB	PP	
3	80-304	MS HEADER TO HPBP VALVE	6,262.00	I	SB	PP	
4	80-307	HP & LP BYPASS WARM UP	1,040.00	I	SN	PP	
5	80-310	HRH FROM REHEATER TO INTERCEPTOR VALVE	118,000.00	I	SB	PP	
6	80-311	HRH FROM INTERCEPTOR VALVE TO TURBINE	13,000.00	I	SB	PP	
7	80-312	LPBP VALVE UPSTREAM & DOWNSTREAM	34,500.00	I	SB	PP	
8	80-320	CRH FROM TURBINE TO REHEATER	59,700.00	I	SB	PP	
9	80-321	HPBP VALVE TO CRH PIPING	9,100.00	I	SB	PP	
10	80-322	CRH PIPING TO DEAERATING HEATER	4,160.00	I	SN	PP	
11	80-324	CRH HEADER TO AUX.PRDS	1,000.00	I	SB	PP	
12	80-331	EXTRACTION STEAM TO LP HEATER-2	2,790.00	I	SN	PP	
13	80-332	EXTRACTION STEAM TO LP HEATER-3	3,410.00	I	SN	PP	
14	80-335	EXTRA CTION STEAM TO DEAERATING HEATER	5,840.00	I	SN	PP	
15	80-336	EXTRACTION STEAM TO HP HEATER NO.1	2,270.00	I	SN	PP	
16	80-337	EXTRACTION STEAM TO HP HEATER-2	1,145.00	I	SN	PP	
17	80-340	AUX STEAM HEADER	1,580.00	I	LU	PP	
18	80-345	AUX STEAM TO DEAERATING HEATER	10,900.00	I	LU	PP	
19	80-348	AUX STEAM TO GLAND SEALS - SG SCOPE	1,220.00	I	SN	PP	
20	80-373	AUX STEAM HEADER SV EXHAUST	7,600.00	N	LU	PP	
21	80-398	TURBINE WASHING STEAM	4,200.00	I	SN	PP	
22	80-420	BOILER FEED PUMP SUCTION	9,730.00	N	LU	PP	
23	80-421	BOILER FEED PUMP RECIRCULATION	17,390.00	I	LU	PP	
24	80-423	BOILER FEED PUMP TO HPH INCLUDING BYPASS	55,556.00	I	LU	PP	
25	80-424	BFD BETWEEN HTRS & GROUP PROTECTN VLV	13,660.00	I	LU	PP	
26	80-425	BFD FROM FINAL HPH TO SG TP	50,490.00	I	LU	PP	
27	80-430	SPRAY WATER TO HPBP	1,000.00	I	SN	PP	
28	80-431	SPRAY WATER TO AUX PRDS	700.00	I	SN	PP	
29	80-432	SPRAY WATER TO BOILER DESH UPTO SG TP	2,400.00	I	SN	PP	
30	80-446	DEAERATING HEATER OVER FLOW AND DRAIN	2,790.00	N	LU	PP	
31	80-449	TG CYCLE PIPING DRAINS & VENTS	11,500.00	N	SN	PP	
32	80-452	HP PIPING DRAINS - SG SCOPE	6,760.00	I	LU	PP	
33	80-453	LP PIPING DRAINS - SG SCOPE	950.00	I	LU	PP	
34	80-612	SERVICE AIR FOR INDIVIDUAL UNITS	6,000.00	N	LU	PP	
35	80-616	INSTRUMENT AIR FOR INDIVIDUAL UNIT	6,100.00	N	LU	PP	
36	80-901	SUB DELIVERY VALVES FOR LIGHT UP	440.00	N	LU	PP	
37	80-921	H&S FOR LIGHT UP STEAM LINE	25,000.00	N	LU	PP	
38	80-922	H&S FOR LIGHT UP - NON STEAM LINES	17,000.00	N	LU	PP	
39	80-923	H&S FOR STEAM BLOWING	130,000.00	N	SB	PP	
40	80-924	H&S FOR SYNCHRONISATION-STEAM LINES	4,940.00	N	SN	PP	
41	80-925	H&S FOR SYNCHRONISATION-NON STEAM LINES	12,000.00	N	SN	PP	
42	80-992	IMPORTED ELECTRODES	250.00	N	LU	PP	
43	81-415	TEST THERMOWELLS	400.00	N	LU	PP	
44	81-416	PERFORMANCE GUARANTEE TEST MATERIALS	830.00	N	SN	PP	
45	22-XXX	HP BY PASS VALVES, SPRAY WATER VALVES WITH OIL UNIT AND PIPING SYSTEM (ONLY IBR PORTTION)	---				
		SUB TOTAL - F (PIPING)	**748,030.00**				

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

SN	PGMA	DESCRIPTION	WT.IN KGS.	ACTIVITY	PACKAGE	PG WT	REMARKS
FROM BAP RANIPET (CUST NO R311)							
G		**ROTATING MACHINES**					
(I)	**AIR PRE HEATERS**						
1	52000	SPECIAL TOOLS/CONTRA	421.42	BLU	ROT M/C		
2	52010	LARG AH-ROTOR ASSY	395,215.57	BLU	ROT M/C		
3	52011	LARG AH-ROTOR POST	15,553.48	BLU	ROT M/C		
4	52012	LARG AH-ROTORPINRACK	3,797.28	BLU	ROT M/C		
5	52013	LARG AH-ROTORSEALS	4,579.64	BLU	ROT M/C		
6	52030	LARG AH-ROTORHOUSING	42,847.89	BLU	ROT M/C		
7	52041	HOT END CONN PLATE	39,700.52	BLU	ROT M/C		
8	52042	COLD END CONN PLATE	60,064.70	BLU	ROT M/C		
9	52054	LARG AH-AXIAL SEAL	416.47	BLU	ROT M/C		
10	52055	LARG AH-BY PASS SEAL	874.59	BLU	ROT M/C		
11	52100	LARGE AH ROTOR DRIVE	3,623.67	BLU	ROT M/C		
12	52210	LARG AH-ACCESS DOOR	1,088.78	BLU	ROT M/C		
13	52211	LARG AH-AIRSEAL PIPE	673.28	BLU	ROT M/C		
14	52212	LARG AH-OBSER. PORTS	62.96	BLU	ROT M/C		
15	52217	LARG AH-STOP.ALARMS	2.76	BLU	ROT M/C		
16	52220	LARG AH-GENS DETAILS	9,400.00	BLU	ROT M/C		
17	52261	LARG AH-GUIDE BEARNG	2,923.64	BLU	ROT M/C		
18	52262	LARG AH-SUPRT BEARNG	4,257.78	BLU	ROT M/C		
19	52271	OIL PIPING GUIDE BRG	498.42	BLU	ROT M/C		
20	52272	OIL PIPING SUPRT BRG	535.64	BLU	ROT M/C		
21	52274	LUB OIL CIRCULN UNIT	1,260.00	BLU	ROT M/C		
22	52301	WASH MANIFLD GAS INL	599.76	BLU	ROT M/C		
23	52302	WASH MANIFLD GAS OUT	568.18	BLU	ROT M/C		
24	52326	CLEANG EQPT GAS OUT	340.00	BLU	ROT M/C		
25	52329	CLE EQPT DRIVE UNIT	1,570.00	BLU	ROT M/C		
26	52360	FIRE SENSING SYSTEM	33.70	BLU	ROT M/C		
						590,910.13	
		SUB TOTAL -(I) (APH)	**590,910.13**				
(II)		**FANS**					
27	55011	FD FAN FOUNDATION MAT	1,575.88	BLU	ROT M/C		
28	55214	1REAC FDFAN1600-2000	13,817.96	BLU	ROT M/C		
29	55810	AXIAL FDFAN COUPLING	700.00	BLU	ROT M/C		
30	55910	AXL FDFAN ACCESSORY	2,100.00	BLU	ROT M/C		
31	55911	AXIAL FDFAN SILENCER	29,400.00	BLU	ROT M/C		
						47,593.84	
32	56021	ID FAN FOUNDATION MAT	4,152.58	BLU	ROT M/C		
33	56031	PA FAN FOUNDATION MAT	1,509.34	SYN	ROT M/C		
34	56135	PA FAN BC1S2000-2500	29,936.89	SYN	ROT M/C		
35	56161	BAC 1 SUC SA FAN	900.00	SYN	ROT M/C		
36	56171	SEALAIRFAN BCSS<1000	2,100.00	SYN	ROT M/C		
37	56228	BAC 2 SUC ID FAN	90,930.53	BLU	ROT M/C		
38	56670	IGNITR FAN MOTOR	6,200.00	BLU	ROT M/C		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

SN	PGMA	DESCRIPTION	WT.IN KGS.	ACTIVITY	PACKAGE	PG WT	REMARKS
39	56820	RADL IDFAN COUPLING	100.00	BLU	ROT M/C		
40	56830	RADL PAFAN COUPLING	400.00	SYN	ROT M/C		
41	56870	SEAL AIR FAN COUPLING	200.00	SYN	ROT M/C		
42	56920	RAD IDFAN ACCESSORY	5,000.00	BLU	ROT M/C		
43	56930	RAD PAFAN ACCESSORY	2,800.00	SYN	ROT M/C		
44	56931	PA FAN SILENCER	30,500.00	SYN	ROT M/C		
						174,729.33	
		SUB TOTAL -(II) (FANS)	**222,323.17**				
		SUB TOTAL -G (ROT MACHINES)	**813,233.30**				
H	**GATES AND DAMPERS**						
1	57010	GATE FAN OUTLET	6,261.48	BLU	NPP		
2	57013	DAMPERS BET FD FAN &	8,188.55	BLU	NPP		
3	57033	DAMPERS AH BY PASS SE	2,225.00	BLU	NPP		
4	57110	GUILLOTENE GATE PA FA	9,205.00	BLU	NPP		
5	57113	DAMPERS BETWEEN PAFAN	2,900.00	BLU	NPP		
6	57143	DAMPER COLD AIR BUS(T	1,465.00	BLU	NPP		
7	57161	MANUAL OPERATOR	500.00	BLU	NPP		
8	57203	DAMP APH TO WINDBOX D	8,422.76	BLU	NPP		
9	57223	DAMP APH PRIMARY SIDE	3,415.00	BLU	NPP		
10	57270	GUILLOTENE GATE DUCT	8,965.00	BLU	NPP		
11	57383	DAMPER ECONOMISER TO	18,700.81	BLU	NPP		
12	57433	DAMPER APH BOILER OUT	18,397.16	BLU	NPP		
13	57460	GUILLOTENE GATE EP IN	20,457.55	BLU	NPP		
14	57480	GUILLOTENE GATE EP OU	32,960.19	BLU	NPP		
15	57490	GUILLOTENE GATE ID FA	22,535.65	BLU	NPP		
16	57491	BLOWER WITH MOTOR	500.00	BLU	NPP		
17	57577	ELECT ACTUATOR FOR GA	9,000.00	BLU	NPP		
18	57663	DAMPER HOT AIR BUS TO	3,800.00	BLU	NPP		
19	57853	DAMPER HOT AIR TO MIL	4,830.00	BLU	NPP		
20	57863	DAMPER HOT AIR MILL B	1,220.00	BLU	NPP		
21	57873	DAMPER HOT AIR TO ROC	825.00	BLU	NPP		
22	57883	DAMPER HOT AIR TO MIL	2,410.00	BLU	NPP		
						187,184.14	
		SUB TOTAL -H (NPP)	**187,184.14**				
J	**ELECTROSTATIC PRECIPITATOR**						
1	78201	ROLL/SLIDE SUPPORTS	14,092.00	BLU	ESP		
2	78205	ESP-SUB-DELIVERY COMP	1,500.00	BLU	ESP		
3	78206	INSULATOR HOUSING AS	23,963.88	BLU	ESP		
4	78208	GAS DIST. ASSY	32,000.00	BLU	ESP		
5	78209	GD-RAPPING MECHANISM	6,368.37	BLU	ESP		
6	78210	GD_DRIVE ARRANGEMENT	426.20	BLU	ESP		
7	78211	GAS SCREEN-EP	30,705.42	BLU	ESP		
8	78213	EMIT SYST SUSPENSION	8,718.54	BLU	ESP		
9	78214	SUPPORT INSULATORS	3,840.00	BLU	ESP		

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

SN	PGMA	DESCRIPTION	WT.IN KGS.	ACTIVITY	PACKAGE	PG WT	REMARKS
10	78215	EMITTING ELECTRODES	15,950.10	BLU	ESP		
11	78216	EMIT ELECT RAPP MECH	20,858.24	BLU	ESP		
12	78217	DRIVE ARGT. FOR EMIT.	16,240.27	BLU	ESP		
13	78219	COL ELEC SUSPENSION	88,337.36	BLU	ESP		
14	78220	COLLECTING ELECTRODE	734,445.85	BLU	ESP		
15	78221	EMIT SYS FRAME-TOP	61,272.84	BLU	ESP		
16	78222	EMIT SYS FRAME BOTOM	87,030.76	BLU	ESP		
17	78223	INSPECTION DOORS	9,772.70	BLU	ESP		
18	78224	SHOCK BARS	66,538.72	BLU	ESP		
19	78225	COLL ELECT RAPP MECH	51,500.00	BLU	ESP		
20	78226	COLL ELEC RAPP DRIVE	3,409.63	BLU	ESP		
21	78228	ESP ROOF PANELS	76,751.72	BLU	ESP		
22	78231	GEARED MOTORS FOR RAP	9,043.77	BLU	ESP		
23	78232	EMIT SYS FRAME-MIDLE	130,687.07	BLU	ESP		
24	78242	OUTER ROOF-EP	129,372.46	BLU	ESP		
25	78243	HOPPER RIDGES	31,495.54	BLU	ESP		
26	78244	HOPPER UPPER PART	178,359.44	BLU	ESP		
27	78245	HOP MLD&LOWER PART	162,656.38	BLU	ESP		
28	78246	INSULATOR SUPP PANEL	47,934.79	BLU	ESP		
29	78247	ROOF PANEL ASSY	80,650.94	BLU	ESP		
30	78248	CASING STRUCTURE	224,913.44	BLU	ESP		
31	78249	CASING SHELL/PANEL	510,362.16	BLU	ESP		
32	78250	INLET-OUTLET FUNNEL	79,644.12	BLU	ESP		
33	78255	PENT HOUSE FOR E P	116,713.07	BLU	ESP		
34	78257	SPLITTER&GUIDE VANES	12,484.77	BLU	ESP		
35	78259	SUPPORT FOR ELEC EQPT	24,000.00	BLU	ESP		
36	78261	EP PERF TEST EQUIPT	500.00	BLU	ESP		
37	78263	ASH LEVEL INDICATOR	969.69	BLU	ESP		
38	78265	APP PLATFORM -HOPPER	85,728.43	BLU	ESP		
39	78266	WATER WASHING SYSTEM	3,593.23	BLU	ESP		
40	78272	INTERLOCKS-EP	1,018.80	BLU	ESP		
41	78273	ELECTRICALLY OPERTD H	3,000.00	BLU	ESP		
42	78274	OPACITY MONITOR & ACC	600.00	BLU	ESP		
43	78278	BAPCON & ACCESSORIES	500.00	BLU	ESP		
44	78280	FOUNDATION MATLS FOR	10,671.89	BLU	ESP		
45	78281	SUPPOTING STRUCTURES	268,394.64	BLU	ESP		
46	78290	HEATING ELEMENTS	578.00	BLU	ESP		
47	78291	PANEL TYPE HOPPER HEA	16,000.00	BLU	ESP		
48	78292	AUXILIARY CONTROL PAN	19,000.00	BLU	ESP		
49	78996	TOOLS & TACKLES	200.00	BLU	ESP		
						3,502,795.22	
50	89610	EP GALLERIES&STAIRS	56,060.44	BLU	ESP		
51	89611	ESP ROOF HANDRAILS	4,124.96	BLU	ESP		
		HVR	96,000.00			156,185.40	
		SUB TOTAL -J (ESP)	**3,658,980.62**				
		TOTAL WEIGHT W O - R311	**4659,398.00**				

APPENDIX -I

ESTIMATED WEIGHT OF VARIOUS SYSTEMS IN SCOPE OF WORK

SN	PGMA	DESCRIPTION	WT IN KG	PACKAGE	REMARKS
FROM HYDERABAD					
K		**ROTATING MACHINES (MILL)**			
1	62009	TOOLS & ACCESSORIES (1SET/ UNIT)	47,940.00	ROT M/C	
2	62029	FLUSHING SYSTEM (1 SET/UNIT)	165.00	ROT M/C	
3	62109	MIL BODY ASSEMBLY WITH LINERS & BALL CHARGE	270,000.00	ROT M/C	
4	62119	SUPPORT BEARING ASSEMBLY	11,630.00	ROT M/C	
5	62129	GIRTH GEAR HOUSING	3,530.00	ROT M/C	
6	62209	CONVEYOR ASSEMBLY	28,280.00	ROT M/C	
7	62309	CLASSIFER ASSEMBLY	20,160.00	ROT M/C	
8	62409	BALL FEEDING ASSEMBLY	1,860.00	ROT M/C	
9	62509	MILL MAIN BEARING LUBE OIL UNIT	3,910.00	ROT M/C	
10	62519	MILL MAIN BEARING LUBE OIL PIPING	710.00	ROT M/C	
11	62539	GIRTH GEAR GREASING SYSTEM	300.00	ROT M/C	
12	62549	FIRE PROTECTION SYSTEM	692.00	ROT M/C	
13	62559	NOISE LEVEL	20.00	ROT M/C	
14	62569	DELTA 'P' PANNEL AND PIPING	650.00	ROT M/C	
15	62579	SCREW CONVEYOR MOUNTING SYSTEM	30.00	ROT M/C	
16	62609	SOUND HOOD ASSEMBLY	27,110.00	ROT M/C	
17	62709	DRIVE GROUP ASSEMBLY	34,670.00	ROT M/C	
18	62759	JAW CLUTCH ASSY WITH INCHING REDUCER	3,090.00	ROT M/C	
19	62809	COMMISSIONING SPARES	760.00	ROT M/C	
20	62909	FOUNDATION MATERIALS	4,755.00	ROT M/C	
		TOTAL FOR ONE MILLS (EXCL TOOLS)	412,322.00		
		FOR 3 MILLS (INCL TOOLS)	**1,284,906.00**		

SUMMARY

SN	Package	Trichy	PC	BAP	Hyderabad	Total	Remarks
1	Structures	3990.289				3990.289	
2	Pressure Parts	2224.918				2224.918	
C	Non Pressure Parts	2178.289		187.184		2365.473	
D	Rotating machines	189.642		813.233	1284.906	2287.781	
E	ESP			3658.981		3658.981	
F	Piping	125.166	748.03			873.196	
	TOTAL	**8708.304**	**748.03**	**4659.398**	**1284.906**	**15400.638**	

NOTES:

1. BESIDES PRODUCT GROUPS INDICATED HEREIN, THERE IS LIKELIHOOD OF ADDITION OF NEW PRODUCT GROUPS BY BHEL' s UNIT FOR RELEASE OF SOME ITEMS, INTEGRAL TO THIS

WORK. TENDERERS' QUOTED UNIT RATES SHALL BE APPLICABLE FOR SUCH PRODUCT GROUPS ALSO.

2. BHEL' s DECISION WITH REGARD TO CLASSIFICATION OF A PARTICULAR PRODUCT GROUP FOR APPLICABLE RATE CATEGORY SHALL BE FINAL & BINDING ON THE CONTRACTOR.

3. BESIDES THE ABOVE, WEIGHT OF ALL TEMPORARY PIPING, VALVES, PUMPS, TANKS AND OTHER MISCELLANEOUS EQUIPMENTS ETC FOR CARRYING OUT HYDRAULIC TEST, CHEMICAL CLEANING, STEAM BLOWING AND OTHER TESTS, AS STATED ELSEWHERE WILL GET ADDED.

4. # - ELECTRICAL & C&I ITEMS OF HANDLING SYSTEM (PG99) IS EXCLUDED FROM THE SCOPE OF WORK.

APPENDIX – II
LIST OF IBR SITE WELD JOINTS

HIGH PRESSURE WELD JOINTS FOR PRERSSURE PARTS SYSTEM

Sl No	Description	Material	Size (mm) (Dia x Thick)	No.of Joints
	PG 04 TO 07:			
1	Down Comer	SA 515 Gr.70 + SA 515 Gr.70	457.2 x 40	58 Nos.
2	Ring Headers	SA 106 Gr.C + SA 106 Gr.C	406.4 x 56	4 Nos.
3	Water Wall Panels	SA 210 Gr.C + SA 210 Gr.C	63.5 x 5.6	3428 Nos.
4	Rear Arch Screen Tube	SA 210 Gr.C + SA 210 Gr.C	76.1 x 7.1	315 Nos.
5	Riser Pipe	SA 210 Gr.C + SA 210 Gr.C	127 x 12.5	454 Nos.
6	Hand Hole Pipe Assly.	SA 106 Gr.B + SA 234 wpc	127 x 20	12 Nos.
	PG 12:			
1	SH Conn. Pipes	SA 106 Gr.C + SA 106 Gr.C	127 x 12.5	66 Nos.
2	SH Roof Tubes	SA 213 T 11 + SA 213 T 11	51 x 5	400 Nos.
3	SH Roof Outlet Header + SH Side Wall Inlet Header	SA 106 Gr.B + SA 106 Gr.A	323.9 x 40	2 Nos.
4	SH Side Wall Inlet Header + Tubes	SA 210 Gr.C + SA 210 Gr.C	44.5 x 4.5	750 Nos.
5	SH Side Wall Outlet Header Elbow + Front / rear Wall Inlet Header	SA 106 Gr.C + SA 106 Gr.C	273 x 36	4 Nos.
6	SH Rear Wall Inlet Header + SH Rear Wall	SA 210 Gr.C + SA 210 Gr.C	44.5 x 5	216 Nos.
7	Hand Hole Plate	SA 106 Gr.B + SA 234 wpc	127 x 20	2 Nos.
8	SH Jn. Header Nipple + SH Rear Roof	SA 210 Gr.C + SA 210 Gr.C	44.5 x 4.5	408 Nos.
9	SH Front Wall Header + SH Extl. Side Wall Supply Pipe	SA 106 Gr.C + SA 1-6 Gr.C	127 x 12.5	4 Nos.
10	SH Extl. Header Nozzle + Roof Inlet Pipe	SA 106 Gr.C + SA 106 Gr.C	127 x 12.5	12 Nos.
11	LTSH Inlet Header Nipple + Loose Tube + LTSH Coils	SA 210 Gr.C + SA 210 Gr.C	47.63 x 5	924 Nos.
12	LTSH Coils	SA 210 Gr.C + SA 213 T 11	47.63 x 5	528 Nos.
13	LTSH Coil	SA 213 T 11 + SA 213 T 11	47.63 x 5	1280 Nos.
14	SH DESH	SA 335 P 12 + SA 335 P 12	368 x 40	10 Nos.
15	SH Platen Coil	SA 213 T 11 + SA 213 T 22	47.63 x 10	32 Nos.
		SA 213 T 22 + SA 213 T 22	47.63 x 10	930 Nos.
16	SH DESH Stage-II	SA 234 WP12 + SA 234 WP12	406.4 x 65	4 Nos.
		SA 335 P 12 + SA 335 P 12	406.4 x 65	8 Nos.
17	Steam Cooled Spacer	SA 210 Gr.C + SA 213 T 11	44.5 x 4	15 Nos.
		SA 213 T 11 + SA 213 T 11	44.5 x 5	7 Nos.
			51 x 5	1 No.
18	Platen SH Coil	T 91	51 x 7.1	300 Nos.
19	Final SH Coil	T 91	44.5 x 5.6	400 Nos.
20	RH Coil	T 91	54 x 4	400 Nos.
	PG 17:			
1	RH Header Nipple + Coil	SA 213 T 11 + SA 213 T 11	63.5 x 4.5	65 Nos.
		SA 213 T 11 + SA 213 T 22	51 x 5	65 Nos.
		SA 213 T 11 + SA 213 T 22	47.63 x 4	260 Nos.

Sl No	Description	Material	Size (mm) (Dia x Thick)	No.of Joints
2	RH Coil + Coil	SA 213 T 22 + SA 213 T 22	54 x 4	390 Nos.
		SA 213 T 22 + SA 213 T 22	44.5 x 5	195 Nos.
		SA 213 T 22 + SA 213 T 22	63.5 x 6.3	65 Nos.
		SA 213 T 22 + SA 213 T 22	51 x 5	65 Nos.
		SA 213 T 22 + SA 213 T 22	63.5 x 4.5	65 Nos.
	Economiser:	-	-	-
1	Eco Feed Pipe + Reducer Valve	SA 106 Gr.C + SA 234 wpc + SA 217 wcb	368 x 48	2 Nos.
2	Eco Feed Pipe	SA 106 Gr.C + SA 234 wpc	368 x 32	1 No.
		SA 234 wpc + SA 234 wpc	323.9 x 40	1 No.
3	Eco Coil	SA 210 Gr.A1 + SA 210 Gr.A1	44.5 x 4.5	591 Nos.
		SA 210 Gr.A1 + SA 210 Gr.A1	44.5 x 5	354 Nos.
4	Hand Hole Plate	SA 106 Gr.B + SA 234 wpc	127 x 20	6 Nos.
5	Eco Coil + Coil	SA 210 Gr.C + SA 210 Gr.C	44.5 x 5	594 Nos.
6	Eco Link to Drum + Hdr. Tee	SA 234 wpc + SA 234 wpc	323.9 x 35	2 Nos.
7	Eco Pipe + Elbow	SA 106 Gr.C + SA 234 wpc	273 x 32	14 Nos.

NOTE:
THE NUMBER OF JOINTS INDICATED HEREINABOVE ARE ONLY TENTATIVE AND LIKELY TO VARY IN ACTUAL. CONTRACTOR SHALL CARRY OUT ALL NECESSARY SITE WELD JOINTS REQUIRED FOR COMPLETION OF ENTIRE SCOPE OF WORK UNDER THESE SPECIFICATIONS. NO ADDITONAL PAYMENTS SHALL BE MADE FOR ANY VARIATIONS IN THE ACTUAL QUANTITY OF JOINTS CARRIED OUT.

APPENDIX – III
LIST OF T & P TO BE MADE AVAILABLE BY BHEL FREE OF CHARGES

TOOLS AND PLANTS TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS

SN	DESCRIPTION OF T&P	QUANTITY	REMARKS
01	300 T CRAWLER CRANE	01	THIS WILL BE HIRED BY BHEL. REFER NOTE -1 BELOW FOR USAGE.
04	INDUCTION HEATING M/C	As required	FOR DETAILS REFER CLAUSE NO. 4.4.2.7
06	HUCK BOLTING MACHINE COMPLETE SET	As required	FOR HUCK BOLTING OF SHOCK BARS AND SHOCK PADS.
07	AIR LEAK TEST EQUIPMENTS WITH ALL AUXILIARIES	01 SET	FOR AIR LEAK TEST OF ESP AND DUCTING.

NOTE: 1. THIS CRANE (300 T CAP) IS TO BE USED FOR ERECTION OF BOILER CEILING STRUCTURES AND EQUIPMENT/ COMPONENTS ABOVE BOILER CEILING STRUCTURE THAT REQUIRE SERVICES OF THIS CRANE AS DECIDED BY BHEL. THIS CRANE WILL ACCORDINGLY BE DEPLOYED AT APPROPRIATE TIME AS DECIDED BY BHEL FOR SUITABLE DURATION AND INTENDED PURPOSE.

APPENDIX – IV
LIST OF MAJOR T & P TO BE DEPLOYED BY THE CONTRACTOR

A: TOOL & PLANTS TO BE DEPLOYED BY THE CONTRACTOR

SN	DESCRIPTION OF EQUIPMENTS	CAPACITY (MINIMUM)	MINIMUM QUANTITY
1	CRAWLER CRANE	75 T	01 No. -TO BE DEPLOYED FROM 1ST MONTH.
2	CRAWLER CRANE	18 T	01 NO.
3	CRAWLER CRANE / TYRE MOUNTED CRANE	75 T	01 Nos
4	PICK & CARRY MOBILE CRANE	8-10 MT	03 NOs
5	TRAILER WITH HORSE (ATLEAST 1 NO. TO HANDLE UPTO 50 T LOAD)	OF ADEQUATE CAP	01
6	TRAILER WITH HORSE (20 MT CAP)		02
7	AIR COMPRESSOR (ELECTRIC/DIESEL) – 7 Kg/cm^2	140 CFM	01
8	TIG WELDING SET	-	AS REQUIRED
9	3 Ph DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWL OF CONSTRUCTION POWER	600 Amp, 415 Volt	AS PER REQMT
10	PRE HEATING / STRESS RELIEVING SET (HEATING CONTROL PANEL, CABLES, HEATING ELEMENTS ETC)	AS PER REQUIREMENT	AS REQUIRED
11	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE	IR 192 / COBALT 60	AS REQUIRED
12	THEODOLITE OF REQUIRED ACCURACY	-	02No.
13	SELF DRILLING CUM TAPPING MACHINE FOR SCREWS OF FLOOR GRILL & BOILER ROOF SHEETS	-	02 Nos.
14	ARRANGEMENT FOR UT OF HIGHER THICKNESS JOINTS WITH RECORDING FACILITY.	TYPE USN 50 OR EQUAVALANT/ UPGRADED TYPE	01 SET
15	ELECTRO-HYDRAULIC PIPE BENDING MACHINE	2" Nb X 12 mm THICK PIPES	01 Nos.
16	HYDRAULIC PIPE BENDING MACHINE	UP TO 50 mm Nb PIPES	02 Nos.
17	WELDING GENERATOR (ELECTRIC & DIESEL)	300 AMPS	AS REQUIRED
18	RADIOGRAPHY FILM VIEWER	HI INTENSITY	2 NOS.
19	ELECTRIC CABLE FOR DRAWAL & DISTRIBUTION OF CONSTRUCTION POWER	AS PER SITE REQUIREMENT	AS PER SITE REQUIREMENT
20	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS PER REQUIREMENT	02 EACH
21	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS PER SITE REQUIREMENT	40
22	**ACID CIRCULATION PUMPS WITH DRIVE MOTORS, STAR-DELTA STARTER PANEL, :**	**150 M^3, 120 – 150M WC, TO HANDLE ACID**	3 NOS.

APPENDIX – IV
LIST OF MAJOR T & P TO BE DEPLOYED BY THE CONTRACTOR

SN	DESCRIPTION OF EQUIPMENTS	CAPACITY (MINIMUM)	MINIMUM QUANTITY	
		SOLUTION, OPR TEMP 80 DEG CEL, WITH 90 KW, 3000 RPM, 150 AMPS MOTOR		
23	ELECTRIC MOTOR DRIVEN HYDRAULIC TEST PUMP WITH DRIVE AND STARTER ETC.	400 Kg/Cm^2 600 Kg/Cm^2	1 NO. 1 NO.	
24	WOODEN/CONCRETE SLEEPERS	ASSORTED SIZES –6' LENGTH	8,000 Nos	
25	SLINGS, 'D'-SHACKLES, HYDRAULIC JACKS, ETC.	AS REQUIRED	AS REQUIRED	

B: MEASURING AND MONITORING DEVISES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

NOTE:
THE LIST INDICATED ABOVE IS ONLY SUGGESTIVE AND NOT EXHAUSTIVE. CONTRACTOR SHALL DEPLOY ALL OTHER T&P AND MMD AS WELL THAT ARE NECESSARY FOR PROPER EXECUTION OF WORK UNDER ERECTION & COMMISSIONING OF BOILER & AUX, MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES SCOPE OF WORKS.

APPENDIX -V

ANALYSIS OF UNIT RATE QUOTED

SL.NO.	DESCRIPTION	% OF QUOTED RATE	REMARKS
01	SITE FACILITIES VIZ., ELECTRICITY, WATER OTHER INFRASTRUCTURE.		
02	SALARY AND WAGES + RETRENCHMENT BENEFITS		
03	CONSUMABLES		
04	T&P DEPRECIATION & MAINTENANCE		
05	ESTABLISHMENT & ADMINISTRATIVE EXPENSES		
06	OVERHEADS		
07	PROFIT		

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VI

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN

(CATEGORY -WISE NUMBERS TO BE INDICATED FOR EACH MONTH)

SL. NO.	(i) CATEGORY	(ii) MONTHS										
		1	2	3	4	5	6	7	8	9	10	SO ON
01	RESIDENT ENGINEER											
02	ERECTION ENGINEERS											
03	ERECTION SUPERVISORS											
04	QUALITY ASSURANCE ENGINEER											
05	SAFETY ENGINEER											
06	MATERIALS MANAGEMENT SUPERVISORS											
07	HIGH PRESSURE WELDERS											
08	STRUCTURAL & OTHER WELDERS											
09	FITTERS											
10	CRANE OPERATOR											
11	TRUCK/TRAILER DRIVERS											
12	STORE KEEPERS											
13	ELECTRICIANS											
14	SEMISKILLED/ UNSKILLED WORKERS											
SO ON												
	MONTH WISE TOTAL											

Article III. SIGNATURE OF TENDERER

DATE:

APPENDIX–VII

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS

SL. NO.	(i) DESCRIPTION & CAPACITY OF T&P	(ii) MONTHS										
		1	2	3	4	5	6	7	8	9	10	SO ON
01												
02												
03												
04												
05												
06												
07 08												
09												
10												
SO ON												

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VIII

CONCURRENT COMMITMENTS

SL.NO.	FULL POSTAL ADRESS OF CLIENT AND NAME OF OFFICER IN-CHARGE	DESCRIPTION OF THE WORK	VALUE OF THE CONTRACT	COMMENC-EMENT DATE	SCHEDU-LED COMPLE-TION	% COMPL-TD. AS ON DATE	ANTICIPA-TED COMPLN. DATE	REMARKS

DATE

SIGNATURE OF THE TENDERER

APPENDIX– IX

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SL. NO.	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN CHARGE	DESCRIP - TION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCE MENT OF WORK	ACTUAL COMPLETION TIME (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS
1								
2								
3								
4								
5								
6								

BIDDERS SHALL ENCLOSE COPIES OF DETAILED WORK ORDER (GIVING BILL OF QUANTITIES AND SCOPE OF WORK) AND COMPLETION CERTIFICATE IN SUPPORT OF THIS STATEMENT.

DATE SIGNATURE OF TENDERER WITH SEAL